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ORIGINAL LECTURES.

A CLINICAL LECTURE ON EMPYEMA AND ITS ANTISEPTIC TREATMENT.[1]

Delivered at the Montreal General Hospital, June 24th,

BY WILLIAM OSLER, M.D., M.R.C.P. LOND.,
PROFESSOR OF THE INSTITUTES OF MEDICINE, MCGILL UNIVERSITY.

GENTLEMEN: I wish to speak to you to-day on the subject of empyema and its treatment by the antiseptic method. You saw yesterday a case which was operated upon in this way, and I will first read to you the clinical report.

Mary S., aged twenty-seven, was admitted June 6th. Is unmarried, a servant. Nothing special in the family history. She has been a healthy girl. Four weeks ago she had chills and pain in the left side; no cough or expectoration. She was attended by Dr. McCallum, who diagnosed pleurisy, and on Thursday, June 1st, drew off with the aspirator three pints of turbid, greenish-yellow fluid; the patient was relieved by this tapping, but on the 6th the temperature had risen; she was not so well, and she was recommended to come to the hospital. On admission she was noted to be pale, fairly well nourished, cheeks flushed, temperature 103°. On examination of the chest, the left side did not expand as much as the right. The intercostal spaces were not so distinct, the tactile fremitus was absent. Apex beat to the right of the sternum. On percussion there was dulness over the whole lung, except in the infra-clavicular region. The two sides were of equal size. She complained of a good deal of pain, and the skin was hyperæsthetic. On auscultation, the breathing was exceedingly weak and distant. The evening temperature on the 7th, 8th, and 9th, reached nearly 102°. On the 12th, she was again aspirated and fifty-one ounces of pus removed; she got considerable relief from this. The respirations were reduced from about forty to twenty-four in the minute, and the temperature remained at about 99° in the morning, reaching 100° in the evening. On the 20th, the temperature went up to 103.5°; on the 21st and 22d, it remained at about 102°. She did not seem so well, and we then determined to make a free opening in the chest and treat the case antiseptically. The operation was performed by Dr. Fenwick in the following way. He made an incision in the eighth intercostal space on the left side, on the outer margin of the infra-scapular region, just at the junction of this with the infra-axillary region. He then opened the pleural cavity and put in a silver canula, which was devised several years ago by Dr. Roddick, after repeated trials, for special use in cases of empyema. The canula, which is slightly curved, has the following dimensions: orifice is oval, three-quarters by one-half an inch; a wide flange surrounds it, two and a half by one and a half inches, and provided with eyelets for tapes. The tube is bevelled at its inner end, and measures about two inches in length, and has twelve small perforations. A shorter tube was found to slip out. In cases in which it has been used, this one has given great satisfaction, as it allows of very free drainage from the pleural cavity, and being solid prevents the pressure of granulations and secures a space of constant size through which the pus can exude. As you saw, the most careful antiseptic precautions were taken. About thirty-two ounces of pure pus were removed. It was dressed antiseptically. The cavity was not injected and the layers of antiseptic gauze, soaked in 1 to 40 carbolic acid, were placed directly over the tube, tow was placed outside this, and the side then bandaged. The rule is to repeat the dressing as soon as the discharges get to the edge. Dr. Duncan, last night, dressed the case again, as the discharges had saturated the tow and gauze; and it was dressed again this morning. You have just seen that this patient is in a comfortable condition to-day. The temperature is 98°, respiration twenty-four, pulse one hundred and eight. She expresses herself as feeling very easy, and we hope she will do as satisfactorily as the cases I am about to describe to you. This is the fourth case in which I have had the patients treated on the strict antiseptic plan, and as they have done unusually well, I am at present very strongly impressed with the good results we have obtained.

CASE I.—The first case I had treated in this way was a delicate looking lad, aged 16, who was admitted June 13, 1880, with empyema of left side; all the physical signs well marked. He had been ill four or five weeks, and the chest had been aspirated once by Dr. Ross; the fever was irregular; pulse weak; respirations much accelerated; profuse sweating. The tube was inserted on the day of admission and about four pints of pus removed. This lad was in a very critical condition, very weak and debilitated, and we had grave fears as to the result; however, he did remarkably well. The chest was dressed whenever the discharges reached the edge of the dressing. For some weeks he remained feeble, the temperature going up occasionally as high as 103°. After about a month he began to improve, the discharge got less, and the side of the chest began to fall in. After a treatment of about two months he was materially better, discharge very slight, and on the 27th of September he was discharged perfectly cured and in very good condition, having increased considerably in weight. We had removed the tube some weeks before he left the hospital. I saw him a couple of months afterwards and exhibited him to the Medico-Chirurgical Society; he had then gained forty or fifty pounds in flesh, and had returned to work. There was a slight contraction of the left side of the chest, but he had made a satisfactory recovery.

CASE II. was under our care during last summer session. This was a French lad, aged 20, who was also sent in by Dr. Ross. He had empyema of the left side. It had lasted for several weeks, and he had been tapped once and a quantity of pus drawn off. When he came to the hospital, he had irregular fever and sweating and considerable constitutional disturbance. I thought also at the time that he had some affection of the apex of the right lung, as there were râles in that region. There was universal dulness over the left side, with the exception of the infra-clavicular region, and the usual physical signs of effusion. Dr. Fenwick operated in the way I have described to you; the case was dressed antiseptically, and the lad made a remarkably good recovery. He entered the hospital on the 28th of May, and on July 23d he left completely well, having gained in flesh and with the wound quite healed. I exhibited this lad also, with the other one, before the Medico-Chirurgical Society, and in both of them the result was everything that could be wished.

[1] Reported by Mr. S. A. Abbott, of the Hansard Staff.

CASE III. was also under observation last summer—a man named Clarke, aged about forty-three. He was in the hospital for a couple of weeks with pleural effusion on the right side. There was irregular fever, and we suspected that the fluid was probably purulent. On using the hypodermic needle, we found that there was pus, and he was treated in the way I have already described. The pus was drawn off, and antiseptic dressings were applied every day or every second day, according to the amount of the discharge. This man was admitted April 19 and discharged July 4, perfectly well, having been seventy-five days in hospital. The tube had been removed several weeks before he left the hospital, and at the time of his discharge the breath sounds were audible at the angle of the scapula. He had improved in general health, and he went back to his work. I saw him several months afterwards, and he had kept well.

These three cases of empyema stand out very distinctly in my memory, inasmuch as they are among the few instances in which I have seen good recoveries in this disease. It is always regarded as an exceedingly serious thing for a person to have pus in the pleural cavity. The liability to constitutional disturbance, the difficulty of getting the suppurating pleural membranes to granulate and heal, are well known, and render this disease extremely difficult to treat satisfactorily. Under the antiseptic plan I believe many of these difficulties are obviated. In these cases the temperature after operation, particularly in the man Clarke and in the second case, remained normal, and it would seem that if there is no blocking of the tube, and you get free discharge, this disease, like an ordinary abscess when treated antiseptically, will get perfectly well in the majority of instances, and with very little constitutional disturbance. Of course, when you are in practice, it will be difficult for you to get the complete antiseptic apparatus; perhaps as young practitioners it is not desirable that you should, unless you devote yourselves specially to surgery. This method must, from these circumstances, be confined chiefly to hospital practice, but where you have a case of empyema you can always follow out these general rules: *Get rid of the pus as soon as you can, as completely as you can, and give as thorough drainage as you can to the abscess cavity in the chest*, and if you follow out these you will probably have excellent success in the majority of cases of empyema. A thorough withdrawal of the pus is, I believe, essential, as well as thorough drainage. It does not appear to make much difference whether you wash out the chest or not with carbolic acid or iodine, provided you have an effectual outlet. If the orifice is large, and in a situation where the drainage will be complete, then I do not think washings are so necessary. But if you have a narrow orifice, you may have to make a counter-opening, and put in a drainage-tube, and wash out thoroughly. This is the method usually followed: A drainage-tube is put in and the chest is washed out with dilute carbolic acid, or with dilute iodine. I have seen a good many cases treated that way, and I must say that, excepting in the cases of children, satisfactory recovery has been exceedingly rare. It is notorious that the results in many instances of empyema are most unfavorable; several recent records of such cases have surprised me by their high rate of mortality. One of the best series of cases I know of is that reported by Dr. J. G. Blake, of the Boston City Hospital,[1] who, by means of thorough drainage and a free opening in the dependent portion of the affected side, was able to cure thirteen cases out of nineteen, and two others were very greatly improved. These results were obtained without special antiseptic precautions, and I refer to them with pleasure, for I do not wish you to think that it is only under this plan that cases do well.

As you are aware, in this woman we aspirated the chest first; and the rule is in a case of empyema to draw off the fluid with the aspirator at least once. A few cases do well with a single aspiration, and in children this is almost the rule. But in adults, unfortunately, the case usually goes from bad to worse, unless a very free opening is made. In these four cases the intercostal spaces have been of sufficient size to admit the tube. In some instances the space is not large enough, and you may have to resect a portion of a rib, in order to get plenty of room.

And now a few general remarks on the disease. In some cases the fluid appears to be purulent almost from the outset. In the case of this woman, the fluid, when first drawn off, was turbid, of a cream-yellow color, and probably became purulent shortly after its formation. Of course, the ordinary sero-fibrinous fluid of a pleurisy contains numerous leucocytes, and the conversion of such a simple effusion into a purulent one is a matter of multiplication of these. Purulent fluid is simply the serum densely infiltrated with the leucocytes. In debilitated persons the fluid is much more apt to become purulent than in the strong and healthy. There is but one invariable and sure means of ascertaining whether the fluid is pus or not, and one that is easily applied. Take your hypodermic needle, and thrust it into the chest, and draw off some of it. A simple enough method, but one which is not often enough resorted to. There are numerous practitioners throughout the country who never think of using the hypodermic needle except for purposes of medication, whereas it is of almost as much importance in diagnosis. In cases of pleural effusion, or of doubtful dulness, in the posterior part of the chest, you need never hesitate to thrust the hypodermic needle into the regions affected. It is so simple an operation that it does no harm, while the indications you get from it are of the greatest value.

Professor Bacelli, of Rome, described a few years ago a new sign by which to distinguish between simple and purulent effusions. I tried it in the case of the woman, but it was not very satisfactory. It is as follows: The affected side of the chest is auscultated, and the patient turns the head to the opposite side and whispers. If the fluid is serous, the voice sounds are conveyed to the ear; if it is a purulent fluid, the whispered sounds are not so conveyed. In some instances this method proves useful, and in some it does not. In one case, particularly, it proved to be correct.

Another point worth noting is that, in cases of simple effusion, the patients usually lie on the affected side; whereas, in cases of purulent effusion—why it is I do not know, but it has been specially noted by Dr. Churton, of Leeds, and I have observed it myself—they usually lie on the opposite side.

What becomes of the effusion if it is not removed? It may be absorbed. Adhesions form between the pleura in certain parts, and you may have multilocular empyema, which may be cured naturally, though it will be a struggle and tax the vitality of the patient. It may perforate into the lung to be discharged through the bronchial tubes, which I think is a very favorable way. The cases we have had in this hospital of perforation into the lung and discharge have done exceedingly well. Dr. Ross has had two such cases which recovered perfectly. Dr. Wilkins has a case at present, I believe, in the wards, in which the pus perforated the lung and was discharged by coughing. It may also perforate the diaphragm, but that is rare. It may perforate externally (empyema necessitatis) and discharge for months or leave a permanent pleural fistula. A point to be borne in mind, in cases of left-sided em-

[1] Hospital Reports, 2d Series, 1877.

pyema, when they begin to pass towards the surface, is that they sometimes pulsate, and the pulsation is exceedingly likely to be confounded with that of an aneurism. In the chronic cases the patients have irregular fever, and the prolonged discharge is likely to induce either amyloid disease of the organs, or else the sound lung on the other side becomes affected and they get tuberculous.

The effects of a large pleural effusion, whether purulent or not, upon the lung are very well seen in this specimen, which was taken from a case of empyema, in which the patient died of acute pneumonia of the opposite lung. You see here that the lung is flattened to a cake-like mass, pressed back against the side of the vertebral column.

Among the advantages of the antiseptic method in empyema appear to be:

(1.) Ample provision is made for free and continuous drainage.

(2.) The avoidance of putrefaction; in none of the cases were the discharges in the slightest degree offensive.

(3.) The ease with which the operation is performed and the small amount of trouble entailed in the subsequent dressings.

(4.) The healing is more rapid, and serious consequences, as amyloid disease and phthisis, are less likely to follow.

Note.—July 11. The patient operated upon on the 4th. Has done remarkably well. Temperature normal, except on one evening; dressings changed now every third day; discharge very slight.

ORIGINAL ARTICLES.

PRESIDENT GARFIELD'S CASE AGAIN.

BY FRANK BAKER, M.D.,

ASSISTANT DEMONSTRATOR OF ANATOMY AND LECTURER ON VISCERAL ANATOMY IN THE NATIONAL MEDICAL COLLEGE, WASHINGTON, D. C.

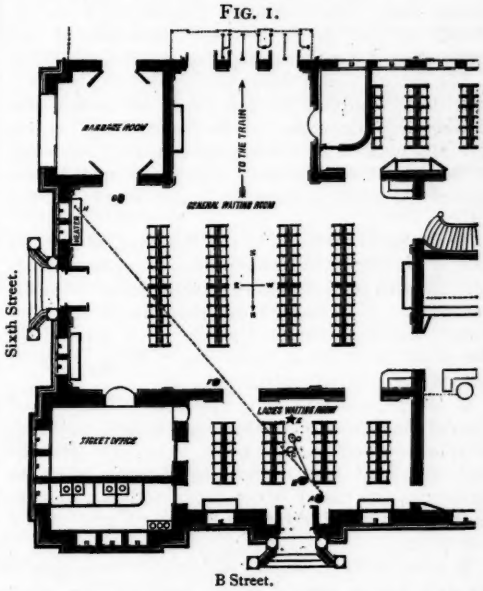
I HAVE read with much interest the article by Dr. White in THE MEDICAL NEWS of June 24th, reviewing President Garfield's case. He rightly states that there is still much misconception regarding several important points, but has, I think, shown that he is himself not entirely free from the error he deplores.

To take up his points in order:

First.—"Did the relative positions of the patient and assassin, at the time of the shooting, afford any indication of the course of the ball as revealed at the autopsy?" Nothing could more strikingly illustrate the difficulty which physicians at a distance have in understanding this fatal case than the statements made by Dr. White in perfectly good faith, and as if the facts were beyond question. He says: "At the time the shooting took place, the President and Guiteau stood about six feet apart, the latter a little to the right of his victim, who was just in the act of turning to the left. . . . All accounts agree that the second shot inflicted merely a slight flesh wound of the arm."

Now, the evidence is conclusive that at no time before he fell did the President turn to the *left*. The only motion of turning was to the *right*. Secretary Blaine, Signor Camacho, Mr. Parke, and Mr. Adams, in their testimony given on the trial of Guiteau,[1] all agree upon this point, and the evidence of Mr. Du Barry is especially conclusive. He was standing at the point marked *F* in the accompanying diagram, which is a ground-plan of the Baltimore and Potomac Railway depot, reduced from the copy used in the trial. Startled by the first shot, he turned towards the sound and saw the President standing, "with his head turned away."[2] If the President had turned to the left, he would have presented his full face to Mr. Du Barry.

FIG. 1.



A. Guiteau's position at first shot. *B.* Guiteau's position at second shot. *C.* President's position at first shot. *D.* President's position at second shot. *E.* Spot where President fell. *F.* Witness Du Barry's position. *G.* Witness Crawford's position. *H.* Spot where first ball was found.

It is also certain that the *second* shot was the fatal one. The positions of the parties, as deduced from a careful analysis of the evidence, are those shown in the diagram. There is no substantial conflict of evidence as to these positions. The position at the second shot is specially well fixed by the fact that the witness Crawford, at the point marked *G* in the plan, could not see the President, though he did see Guiteau in the act of firing.[3]

The fact has been strangely overlooked that the missing bullet has been actually found in a ball of putty contained in the kit of a glazier, a Roumanian named Plokschis. The matter was carefully investigated at the time, and the bullet is in the possession of Colonel Corkhill, the District Attorney. It was not brought out upon the trial for the reason that it was not required by anything presented by the defence. The glazier's kit was standing at the point marked *H* in the plan on the end of a heater under a window of the main passenger hall near the baggage-

[1] Official Report, pp. 121–158. [2] Ibid., p. 182.
[3] Ibid., p. 174.

room, and nearly seventy feet away from the place where Guiteau fired. A glance at the diagram, and an analysis of the evidence as to the corresponding positions of assassin and victim at the first and at the second shots, will convince the most sceptical that the bullet found in the putty must have been the *first* one fired.

If the second bullet was the one found, it could not have cut the President's coat-sleeve, and Guiteau's aim must have been very inaccurate. The testimony is unanimous as to the directness of the second shot. The President himself, as I am informed by Col. A. F. Rockwell, said that he was certain that it was the second shot which took effect.

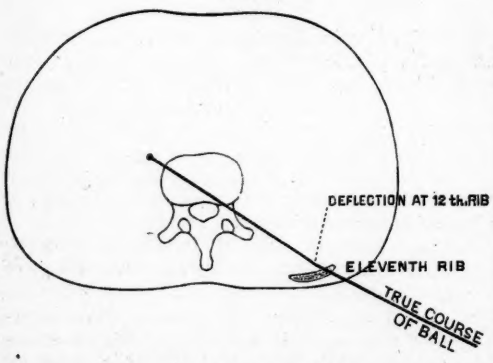
The evidence also shows that while the pistol was held horizontally at the first shot, the muzzle was considerably depressed at the second. This was specially noticed by the witness Crawford, standing at the point *G*. A marked depression would have carried the bullet to the floor before it reached the kit.

The general tradition of the shooting, as it exists among the employés of the railway company, agrees entirely with the positions I have deduced from the evidence. The star in the diagram is the spot where the President finally fell. It is marked on the depot floor by a brass star. His feet were toward the B-Street entrance.

It may, therefore, be considered as established that, at the time of receiving the fatal shot, the President had turned partly to the right, and that the shot was fired from a position diagonally to his right rear, the pistol being held in such a manner as to impel the ball downward, forward, and toward the spine.

It seems strange that any misapprehension of facts so well known should occur, as there was ample opportunity to ascertain the true position of the parties. The witnesses were easily accessible, most

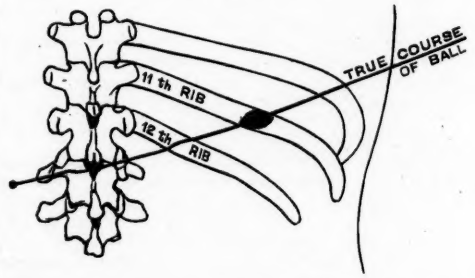
FIG. 2.



of them residents of Washington and employés of the railway company. It is probable that the misapprehension arises from the published report of Dr. Bliss,[1] in which he assumes that a marked deflection must have taken place to carry the ball toward the spine, and an illustration appended[2] apparently shows the point of entrance of the ball as nearer the spine than the point where it struck the eleventh rib. This theory appears to be the one adopted by Dr. White. The contrast between such a course and the one shown by the evidence, becomes striking when placed upon a diagram. Fig. 2 shows this as well as a course not horizontal can be shown in plan.

Fig. 3 is the same, viewed in a vertical plane. The outlines of this latter figure are taken from Fig. 5 of the autopsy report. The location of the points where the ribs were fractured and the vertebra penetrated, may, therefore, be assumed as correct.

FIG. 3.



I am aware that a number of remarkable deflections of the ball have been described as occurring within the body. With the exception of those which took place within the bodies of the vertebræ, these deflections are not confirmed by the official report of the autopsy. In judging of the deflections from the ribs, it should be borne in mind that those who prepare skeletons for anatomical models are in the habit of pushing the ribs upwards and forwards into a position which they occupy in life only during forced inspiration, if at all.

It is perhaps impossible to ascertain the precise angles of deflection from the ribs, as the problem is greatly complicated by their elasticity, and by the impossibility of ascertaining their precise relative position at the fatal moment. It seems probable, however, that the ball was little, if at all, deflected at the eleventh rib, and that what deflection took place was at the twelfth rib after its initial velocity had been somewhat reduced by its first impact.

There is nothing in this case to invalidate the general rule laid down by Hamilton,[1] that conical balls usually go straight to their destination, and Dr. White is not correct when he states that an erroneous conclusion would have been drawn had the physicians relied upon a knowledge of the positions of Guiteau and the President as a means of diagnosis.

Second.—As to probing for the ball. Dr. White correctly states that it would have been unjustifiable to probe the *entire* track of the ball. But that is not exactly the question. Could not the ball have been traced far enough to afford means for a correct diagnosis? It seems beyond doubt that a digital examination, with suitable enlargement of the wound,

[1] Medical Record, Oct. 8, 1881. [2] Ibid., p. 396.

[1] Military Surgery, p. 174.

made immediately after the injury and before the stage of tumefaction had set in, would have sufficiently indicated the course of the ball to show that it had entered the vertebra.

In the course of Dr. White's extensive reading with reference to the case, he has apparently not met with the able article of Dr. Ralph Walsh, of this city,[1] which contains a large amount of original evidence, showing that the *first* examination of the wound was hasty and partial, not even the fracture of the rib being discovered. He quotes from eminent authority to show that the wound should have been enlarged and the spicula from the rib removed to avoid the formation of a pus cavity.

To this Dr. White seems inclined to agree, as he says:

"The rigors which occurred about the 22d of July were due, in the first instance, to the formation of a small abscess under the erector spinæ muscles, possibly caused by the irritation of a small fragment of the broken rib, buried in the contiguous muscle."

It would undoubtedly have been bad surgery to have probed the wound when Dr. Agnew came into the case. But it was far otherwise at first.

the diagram shown below, to which is attached the following certificate:

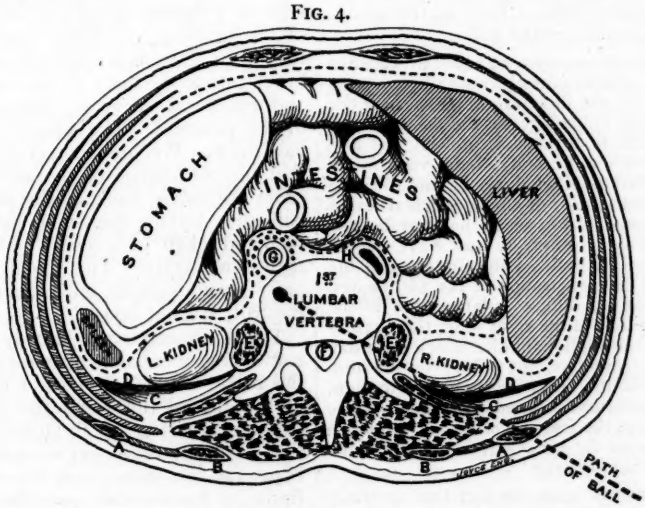
"We, the undersigned, hereby certify that, on or about the evening of July 7, 1881, this diagram was shown us by Dr. Frank Baker, as representing his idea of the course taken by the ball which wounded President Garfield, July 2, 1881. Dr. Baker further stated that it was his opinion that the ball might have passed through the vertebra and lodged beyond.

"D. WEBSTER PRENTISS, M.D.
"N. S. LINCOLN, M.D.
"SMITH TOWNSHEND. M.D."

The diagnosis was based upon the following points:

(*a.*) *The symmetrical character of the pains in the feet.* Dr. White has been misled. He speaks of the pains in the feet as "at first altogether on the right side, and always much more marked on that side than on the left;" and seems to think they were not of marked severity. Now, these pains were mentioned by the patient immediately after the injury, were very severe, and lasted for a considerable time. Dr. Lincoln, whose eminence and authority are undoubted, and who was with the

FIG. 4.



Cross-section of the human body at the first lumbar vertebra and below the pancreas.[2]

A. Eleventh rib. B. Twelfth rib. C. Pleural cavity. D. Diaphragm. E. Psoas muscle. F. Spinal cord. G. Aorta surrounded by solar plexus. H. Vena cava. The dotted line represents the peritoneum.

Third.—Did the subjective symptoms furnish reliable material for diagnosis? In Walsh's *Retrospect* for October, 1881, is an account of a diagnosis made by me two days after the injury, accompanied by

President most of the time during the day of the shooting, gave me, on July 7, 1881, the information contained in the following paragraph, taken from the article above cited:

"He informed me that his attention had been particularly directed to the pains in the President's feet, which were severe and prolonged, resisting the anodyne effects of hypodermic injections. The patient described the pain as located in the soles of the feet, the region of distribution of the posterior tibial nerve. This at once directed Dr. Lincoln's attention to a possible injury of the spine, and he asked if any difference could be distinguished in the sensations of the two feet. The President, after careful consideration, replied that he could perceive no difference. Dr. Lincoln then

[1] Walsh's Retrospect, October, 1881. See also the same for April, 1882, pp. 307, 308.

[2] This diagram was hastily prepared, without reference to any existing representation of the same region, but it is believed to be correct with regard to the main points involved. It was my intention to carefully revise it so as to make it absolutely correct anatomically, and then to publish it in some medical journal. The large area given to the stomach was shown for the reason that the injury was received directly after a hearty meal, and therefore during a state of distention of that viscus. For the same reason a comparatively small area of liver is shown, it being pushed upward and outward by the distended stomach.

supposed that the spine was certainly injured, or that the ball had possibly passed downward into the pelvic cavity and rested on the hypogastric plexus."

(*b.*) *The hyperæsthesia of the right side of the scrotum at the area of distribution of the ilio-inguinal nerve.* This extended also to the lower abdominal region, the area of distribution of the ilio-hypogastric nerve.

(*c.*) *The vomiting*, so immediate and marked that it indicated an injury to the solar plexus.

(*d.*) *Internal hemorrhage.* The pulse had the peculiar thready character known as hemorrhagic. The vessels lie toward the spine. Hemorrhage from the liver would have been more apparent *externally*.

(*e.*) *The inadequacy of any soft tissue to stop a ball of 44 calibre*, fired with twenty-two grains of powder at six feet range. The vertebræ only could do this.

(*f.*) *Negative evidence.* No paralysis; cord not permanently injured. Daily evacuations and no marked icterus; intestines, kidney, and liver intact.

It is easy to attack these symptoms *separately*, as Dr. White has done, and show that each might be differently interpreted. But he surely has not considered their *cumulative* force. They are like guide-posts pointing to the path of the ball:

"The path of the ball was from right to left, forward and downward. It splinters the eleventh rib, traverses the pleural cavity and the diaphragm, passes *over* the left border of the right kidney, grazes the posterior surface of the liver, enters the psoas, injuring the ilio-inguinal nerve, traverses the body of the vertebra in front of the spinal cord, finally lodging behind the peritoneum near the stomach. For each particular lesion distinct symptoms were shown, which, had not the surgeons been led astray by an error, must have guided them to the course of the ball. The splintering of the rib was recognized, the penetration of the pleura and diaphragm gave rise by diffuse inflammation to the trouble in the lower lobe of the right lung, the grazing of the liver caused the slight jaundice which for a day or two misled the surgeons, the injury to the ilio-inguinal nerve caused the sensations at its distribution, the crushing of the vertebra caused concussion of the cord and the pains in the feet and back, the injury to the solar plexus caused the vomiting, the cutting of the artery, the internal hemorrhage."[1]

Dr. White comments upon the fact that no diagnosis was published until after the autopsy. I think that he will on further reflection understand the feeling which prevented young physicians not having access to the patient from publishing remarks on a case in which the best surgical talent of the country was employed. It is proper for me to state that I was by no means alone in my conclusions as to the course of the ball. Several surgeons independently expressed the opinion that the spine was injured, and it was generally a cause of remark that nothing was heard from the physicians in charge leading to that conclusion. It was supposed that there must be imperative reasons for a contrary opinion evident to those in immediate relation to the patient. Had I not fortunately sketched the diagram showing my views, I would have been as unable to present satisfactory evidence of the fact as many others are. If we add to the subjective symptoms the evidence afforded by the position of the parties, we may well wonder at the "absence of diagnosis," as Dr. White is pleased to call it.

Fourth.—If the diagnosis had been correct, would the treatment have been modified? All know the great skill and care that was lavished on our lamented President. But is it safe to say that no different treatment would have been adopted either in decubitus or surgical procedure had a positive diagnosis been made? I think not. When we reflect how the whole nation hung in suspense over the case, the million hands and heads that were ready to follow the slightest suggestion, I do not think we can predict with certainty the developments that might have ensued.

Fifth.—The cause of death. All acknowledge the rupture of the splenic artery as the immediate cause, the only point in dispute being as to how the rupture was occasioned. Dr. White does not even mention the anatomical difficulty. It is this: the artery arises from the cœliac axis, which is opposite the body of the twelfth dorsal vertebra.[1] It proceeds in a tortuous course in a nearly horizontal direction lying in a groove along the posterior *upper* border of the pancreas, the splenic vein being below and behind it. The ball emerged from the spine at the lower part of the body of the first lumbar vertebra, and was found encysted "below the *lower* border of the pancreas. The pancreas is an inch and a half thick. We are compelled to suppose either that the tortuosities of the artery were such as to cover the entire back of the pancreas, or that the ball after leaving the spine passed upward for an inch and a half in a nearly vertical direction, and then down again. The splenic vein which apparently would present more nearly in the track of the ball, was not injured.

Dr. White suggests a "slowly developing inflammation and ulceration extending from the track of the ball." But the report of the autopsy has told us nothing of this. Arteries are almost the last structures to give way to ulceration.[2] Neither is it likely that the vessel was wounded by a spiculum of bone, for the spine is so thoroughly protected in front by ligamentous and tendinous attachments that the detachment of spicula is "difficult if not impossible."[3]

Admitting that it was anatomically possible for the ball to impinge on the artery, it must then have been nearly spent. Would it not have *pushed aside* an artery with strong and elastic coats like the splenic?

Again, how could a traumatic aneurism exist for eighty days in loose subperitoneal tissue, which can readily be peeled up anywhere in the lumbar region by moderate force? The splenic artery is equal to the brachial in size.[4]

Sixth. Was the wound necessarily mortal? Dr. White by no means does justice to the case of the

[1] Walsh's Retrospect, loc. cit.

[1] Power's Anatomy of the Arteries, p. 249.
[2] Agnew's Surgery, vol. i. p. 531.
[3] Hamilton's Military Surgery, p. 337.
[4] *Henle.* Gefässlehre des Menschen, s. 167.

other side. Probably no two wounds were ever *exactly* alike. The amount of affirmative evidence is necessarily small. Gunshot wounds of the bodies of vertebræ not immediately fatal are rare and difficult to diagnose. Opportunities for post-mortem examination of cases of recovery are much rarer. Dr. Walsh[1] cites the following case reported by Dr. Johnson Eliot, one of the most distinguished surgeons of this city, and formerly Demonstrator of Anatomy in the college to which I have the honor of being attached. He says:

"While I was Demonstrator of Anatomy, National Medical College, a cadaver was brought into the dissecting-room for dissection. After it was dissected, the janitor, while cleaning the bones for the purpose of making a skeleton, observed a hard substance in the body of the second or third lumbar vertebra. He drew my attention to it, and, upon examination, I discovered that it was a bullet deeply imbedded in the cancellated tissue of the body. The injury was such a remarkable one, in view of the man's apparent excellent health, that I called it to the attention of Dr. Thomas Miller, then Professor of Anatomy in the College. He expressed great surprise at the injury and interest in the case, and desired me, if possible, to obtain a history of it. After considerable inquiry, I learned that the man had been a marine in the United States service many years; had served his period of enlistment, and been discharged, subsequently engaging in another vocation, and dying in this city of pneumonia. The history of the case and appearance of the body presented no evidence of recent gunshot injury."

Again, in *The Lancet* of May 27, 1881, I find the following abstract of a case from *Gaillard's Medical Journal* (which I have not at hand), and vouched for by Dr. Gaillard. The comments are those of *The Lancet*.

"The patient was an officer in the American army, who was wounded at the battle of Seven Pines, May 31, 1862. He was first struck by a minie-ball, which entered just outside the right anterior inferior iliac spine, and passed out through the buttock without injuring the bones. A little later a ball passed through the calf of his right leg, and he then fell face foremost into the mud. While lying in this position, another minie-ball struck him on the right of the spine, below the false ribs. No symptom of paralysis or visceral lesion supervened. Little or no effort was made to find the bullet, and he left the hospital in a month. The following winter he again served in the army, and bore great fatigue. At the close of the war he returned home in good general condition, but suffering pain in his spine, which did not, however, prevent his undertaking severe physical labor. So he went on until 1875, when, after some very heavy lifting, he was seized with severe pain, and became emaciated and disabled. The sinus in his back had been discharging all this time. This was now explored. A free incision being made down to the body of the first lumbar vertebra, which was felt at the bottom of the wound, the finger could be passed round the part of the body of the vertebra, and the bullet was felt fixed in the bone on the left side. With considerable difficulty the bullet was removed. It was found to have cut a deep groove or tunnel round the right side of the first lumbar vertebra, and to have splintered the last rib. The man's general condition improved considerably at once, but six months later he was again attacked with fever and great pain and swelling on the left side of the spine. Three or four weeks later the swelling was opened, and large quantities of pus "blackened with powder" were discharged. Following this came several small pieces of bone and a piece of cloth two inches long by a quarter of an inch wide, part of the binding of his pantaloons; and a few days after this a piece of bone, with a cup-shaped depression that exactly fitted the extracted bullet, came away. From this time the man steadily improved; the two sinuses closed up, "and he now has no pain in his back, feels well, and is in stout and robust health." This case, interesting in itself, is still more so when considered in relation with the wound of President Garfield. The original injury in the two cases was nearly similar, but it is noteworthy that the patients were very different—one was a young man, the other considerably older; and the course taken by the pus was also different in the two cases. But this case shows conclusively that a gunshot wound of the body of a vertebra is not necessarily a fatal injury, as was hastily and unwarrantably stated in reference to President Garfield's case."

[1] *Loc. cit.*

It may be further said that Dr. White's analysis of Dr. Hammond's citations, still leaves untouched the fact that eminent authorities recognize the possibility of recovery after a gunshot wound of the bodies of vertebræ.

I purposely abstain from advancing any theory or drawing any conclusions. Deploring, no less than Dr. White, the misconceptions which still exist, I have given the reader well-authenticated facts from which he can make his own deductions. If, with such facts as we have shown could have been obtained at the first moment of inquiry, science cannot reach a diagnosis, the energy of the profession should be directed to finding means to do so. If the data for a diagnosis did exist, it can be no excuse for the neglect to make use of them, to allege that the termination of the case would not have been affected.

DISPLACEMENT OF THE SPLEEN AND PANCREAS; SLOUGHING OF BOTH ORGANS; GANGRENE OF INTESTINES.

By W. L. ESTES, M.D.,
MEDICAL SUPERINTENDENT OF ST LUKE'S HOSPITAL, SOUTH BETHLEHEM, PENNSYSVANIA.

CONGENITAL deviations from the normal positions have been reported of all the solid abdominal viscera. Wandering kidneys are frequently met with; displaced livers now and then; and dislocated spleens are not uncommon. But in all the medical literature that the writer has been able to consult, he has not found a case of spleen and pancreas dislocated into the right iliac fossa. Thinking that a report of such a case might be interesting to the readers of THE NEWS, the history and autopsy of the subjoined case are given.

While the reporter was House-Surgeon in Mt. Sinai Hospital, New York, in 1880, Rosa P., nineteen years of age, Hungarian by birth, was admitted into the gynecological ward as a case of "Abdominal Tumor." She was admitted November 2, and gave the following history: Family all perfectly healthy; she herself had been perfectly well up to three years before coming under observation, when she had a very severe attack of what she said her physician called "*liver fever*," which confined her to bed one whole winter. During her sickness she

noticed a "swelling in the right side," but it seemed to disappear entirely after her convalescence. Eighteen months after this she immigrated to America, and almost immediately was again sick with similar symptoms as at her former attack, but of less degree and much shorter duration. Since then she has had three attacks, all marked by pain in the right iliac region, swelling of the abdomen, and slight rise of temperature. After three days she is always able to get out of bed and return to her work (that of an ordinary domestic) without any inconvenience, save slight soreness and pain in the abdomen, which disappears in a few days. Her present attack began seven days before admission. She arose feeling as well as usual, and went to work. In a short time she was seized by such violent pain in her abdomen that she was obliged to return to her bed, and has remained there until brought to the hospital. She says she had not lifted any heavy weight, nor made any extra muscular effort, the day preceding or the morning of her attack; that she knows of nothing that could have brought it on. Her bowels had been regular; menstruation also regular and painless. On admission, the patient presented the appearance of a very muscular and well-developed girl. Ruddy cheeks, and full, rounded form, indicated her previous good health. She seemed to suffer intense pain, referred to the whole abdomen. She could scarcely walk, and when she attempted to do so, bent far forward, in order to relax the abdominal muscles as much as possible. Physical examination showed abdomen slightly distended generally; small umbilical hernia readily reducible; no particular tenderness over any part of the abdomen; palpation discovered a hard, or rather *solid* feeling, mass, occupying the whole of the right iliac region, extending over into the left iliac region to within seven centimetres of the left anterior superior iliac spine, and from this point diagonally upwards (with a distinct free border, having no discoverable notch or indentation) across the umbilical region, into the right hypochondrium, to within five centimetres of the lower border of the ribs; this whole area having a perfectly solid feel, except along the free border, where a peculiar crepitation was felt upon grasping it between the fingers. Percussion note perfectly dull over the whole tumor; no tenderness; hypodermic needle introduced without withdrawing fluid. Vaginal examination showed that the mass filled the right iliac fossa completely, extending behind the uterus, and pushing it so far forward that it was almost shoved over the symphysis pubis—and reached into the left iliac fossa; perfectly solid and *immovable.* Changing of the position of patient in various directions seemed not to vary the position of the tumor the least. Rectal examination added no new light. The form, feel, percussion, and aspiration suggested that it might be the liver displaced downward, its right lobe resting in the iliac fossa, and left lobe upward to the right. *Palpation and percussion over the normal site of the liver showed that organ in place, however;* stomach much distended; percussion over the natural splenic area *seemed to show the spleen in place.* There was certainly sufficient dulness to indicate the presence of a small viscus. Examination of urine negative. Other organs all seemed healthy. Temperature upon admission, 100° Fahr. Complete rest in bed with opium and belladonna suppositories to relieve the pain, and one mercurial purge were ordered.

On the third day after admission, the patient's condition remaining about the same, Dr. Noeggerath, the visiting gynecologist, was called in to see her. The patient was thoroughly examined by us both, under an anæsthetic, without any further discovery except that the right ovary could not be felt, while the left one was easily found. Dr. Noeggerath concluded it was a case of sarcoma of the right ovary.

On the tenth day, six days after this examination, the patient complained for the first time of exquisite tenderness in the right iliac region, and soon developed a case of marked general peritonitis, which subsided after ten days of opium internally and hot water applications externally. It was at this time noticed, much to every one's surprise, that the tumor was markedly lessened.

Four days after this, it is noted, "tumor almost entirely disappeared, only slight induration felt in right iliac region. Vaginal examination shows a corresponding disappearance of the mass from the pelvis. Patient extremely weak and reduced." At this time extreme gastric irritability manifested itself. The patient was at first unable to retain the milk punch which was given her in small quantities, then rejected milk and lime-water as soon as taken, and steadily grew worse, until she vomited almost incessantly, notwithstanding the administration of every remedy known for vomiting, one after the other. Three days of this sufficed to end her life; she died on the 27th, twenty-five days after admission. After the peritonitis, she had no considerable rise of temperature, nor did she complain of any pain or tenderness in the abdomen of any marked degree, until just before she died, when her temperature shot up to 103° Fahr., and she had great pain in the abdomen.

Autopsy, twenty-four hours after death. — Body reduced to skin and bones, so great was the emaciation. Percussion over right iliac region was still, as it had been several days before death, *dull,* almost *flat.* No solid mass felt anywhere over the previously *solid* area. Upon opening the abdominal cavity, a very marked fecal odor was at once noticed. As the incision extended below the umbilicus, there was a large discharge of very fetid pus. Upon examination, it was found that the pus proceeded from an abscess cavity, extending from the level of the umbilicus to the bottom of the cul-de-sac of Douglas, involving the whole right side from this level, and extending to the left no further than the middle line. Intestines in juxtaposition with the abscess, gangrenous, and the ileum was found perforated about its middle, near the mesenteric attachment. A small quantity of blood extravasated into the peritoneal cavity, and quite a large quantity into the intestine itself. Liver much enlarged, and paler than normal. Kidneys also enlarged and pale. The spleen could not at first be found; at last, however, a grayish, sloughy mass, which seemed at first to be

mesentery, upon close examination proved to be the *pancreas*, extending, tail foremost, almost vertically downwards, the head retaining an almost normal position, while the tail was found in the right iliac fossa, near the middle line. In this fossa, after searching some time, a small, flat, soft piece of detached tissue, about five centimetres long by three centimetres broad, was found, which proved, upon minute examination, to be remains of the spleen. That it was splenic tissue, several gentlemen who were present at the autopsy, and others who examined it afterward, bore witness.

The stomach's ligaments seemed elongated, and the organ itself seemed dragged slightly downward. The other organs were normal.

The etiology of this case must be simply conjectural. My own theory—the only one I know of with reference to it—is as follows: It would seem that the patient had congenitally a "wandering spleen." Belonging to the poorer class of Austrian peasantry, she was accustomed to undertake the work of a common farm laborer. While at work in the fields she made some violent effort, and thus by muscular action forced this spleen, with elongated attachments, bodily into the right iliac region. This was followed naturally by very violent inflammatory action, giving rise to her first attack, which her physician called "*liver* fever"—the passive congestion and consequent enlargement of the spleen being very naturally in that situation taken for the liver. The sudden displacement, so powerfully brought about, gave the bloodvessels and nerves, common to the pancreas and spleen, no time to accommodate themselves to the changed condition, and their connection, together with the fold of peritoneum from the pancreas to the spleen, sufficed to bring the tail of the pancreas, by a sort of somersault, along with the spleen. The extreme tolerance of the abdominal viscera to abnormal relations and pressure, is constantly exhibited in cases of wandering kidneys and spleens, as well as the pathological conditions of abdominal tumors involving the various organs. It would not appear impossible, therefore, that the displaced viscera in this case should have returned to the proper performance of their functions, and that the patient should have regained a tolerable degree of health. In this position there must have been a continual passive congestion of the spleen, which would, and no doubt *did*, lead to an interstitial splenitis (cirrhosis or fibroid degeneration). The recurring attacks may be explained by causes similar to first, *i. e.*, some slight over-exertion with the organ in its then position would easily excite a local inflammation of the peritoneum or cellular tissue around the caput coli. Her last attack was probably due to malaria. An already chronically enlarged spleen, its parenchymatous tissue well-nigh replaced by fibroid tissue, suddenly congested by a specific morbific agent—the bloodvessels being necessarily implicated in the previous tissue changes—with chronically dilated walls of vessels and loss of contractility, there would be almost a complete stasis, enormous extravasation, and all the concomitant changes of a destructive inflammation, the result being extensive suppuration, and as the sequel proved, general peritonitis, and finally sloughing of the spleen and pancreas.

The above is, of course, merely offered as one supposition, and the most plausible one that has yet suggested itself. The actual facts at all events, as far as known clinically, are faithfully given. I should be glad to have any other explanation of the phenomena that may occur to any member of the profession.

FRACTURE OF SKULL; TREPHINING; DEATH FROM ABSCESS.

BY R. A. KINLOCH, M.D.,
OF CHARLESTON, S. C.

(*Read at the Meeting of the South Carolina Medical Association, April, 1882.*)

SCOTT MAXWELL, colored, æt. thirty-five, admitted into City Hospital, February 11, P.M., 1882. While working in a pit at one of the Phosphate Works outside of the city, was struck upon the head by another workman with the flat portion of a shovel. He was felled to the earth, and was senseless for some time. After a few hours, recovered sufficiently to be sent in a wagon to the hospital. He then presented the mixed symptoms of concussion and compression, the former predominating. He was placed in bed, head elevated and kept cool, and absolute quiet enjoined. Later an enema was given to empty the bowels, and large doses of potas. bromide directed to be given in the event of restlessness. Upon careful examination no fracture could be discovered, but only a slight abrasion of scalp over right parietal bone, with bloody extravasation under scalp, and general swelling of the soft tissues over the vertex.

Feb. 16.—This A.M. it was reported that patient had had several convulsions in the night, and during one of these had fallen out of bed before the nurse could reach him. The symptoms of compression were more marked, but were not extreme, the pulse was slow, and the temperature slightly below normal.

Dr. Kinloch expressed the opinion that there was likely a fracture of the inner table of the skull, with bloody extravasation upon the dura mater, and beginning effusion, possibly a fissure of skull running into the base. He concluded that the case would likely be hopeless, but that trephining offered the best chance for life.

At 12 M., patient was carried before the medical class, and operation performed under chloroform and with antiseptic precautions. The natural inference from the abrasion over the right parietal bone, and the evidences of contusion there, was that this side of the head had received the force of the blow. The trephine was consequently applied at this point. Upon opening the skull the dura mater was found exceedingly tense, and seemed to crowd into the opening made by the trephine. No signs of fracture or of bloody extravasation beneath the skull could be discovered. The tension of the dura mater was such that it was thought proper to puncture the membrane. This liberated a considerable amount of bloody serum. No further procedure was considered advisable. Wound was dressed with car-

bolized oil upon lint, and several layers of borated cotton superimposed. Patient was put to bed, ice cap ordered to the head, thirty grains of potas. bromide to be given three times a day, and one grain of calomel every four hours. I omit the clinical notes for the first two days.

19th.—Up to this date the patient's temperature had remained below normal. To-day at 9 A. M. the temperature was 102.2°; pulse 72. 9 P. M., temperature 103°; pulse 76.

20th.—9 A. M., temperature 103.5°; pulse 92. 9 P. M., temperature 103°; pulse 76. Calomel stopped to-day, as salivation was evident.

21st.—9 A. M., temperature 100°; pulse 92. 9 P. M., temperature 101.2°; pulse 96.

22d.—9 A. M., temperature 101°; pulse 80. 9 P. M., temperature 101°; pulse 92.

23d.—9 A. M., temperature 102°; pulse 92. 9 P. M., temperature 103°; pulse 100.

24th.—9 A. M., temperature 104°; pulse 64. 9 P. M., temperature 106.5°; pulse 60.

25th.—During day, temperature 103.5°; pulse 68.

26th.—During day, temperature 103°; pulse 84, and scarcely to be felt. Patient expired this evening.

27th. Autopsy.—Skull was found fissured through the whole parietal bone of the *left side*, the fissure running to the base; bloody extravasation between skull and dura mater on *left side*. Between dura mater and brain on *right side*, and extending to frontal region, was a large collection of pus. There was also a small abscess in the substance of the right cerebral lobe, contiguous to the opening in the skull made by the trephine. This abscess was evidently the cause of death.

Remarks.—It will be observed that my inferential diagnosis as to fracture and bloody extravasation was correct, but the fracture was on the opposite side of the head, and not confined to the inner table. It is probable that the patient had received more than one blow with the flat of the shovel, and hence we were deceived in attempting to locate the injury of the skull. The character of the blow was such as to warrant the belief that the inner table had chiefly suffered. Such a blow might well illustrate the views of Mr. Teevan in regard to fracture commencing in the *line of extension*, and not in that of *compression*. Fractures of the inner table alone must be ever obscure, and their diagnosis *always inferential*. The use of the trephine in skull injuries generally, is still a matter of disputation. The propriety of operating after a mere inferential diagnosis will be objected to by the majority of prudent surgeons, who, nevertheless, recognize the close analogy between punctured fractures and simple fractures of the inner table alone. Listerism will perhaps make many surgeons more disposed to venture an operation in head injuries, as they are in injuries of other regions. The conservative opinions of Stromeyer, who thinks it fortunate that fractures of the inner table escape detection *because they thus also escape operation*, will hardly check the tendency of the age to bold experimental procedures. We are indebted to Dr. Lidell, of New York, for most valuable reports and able arguments in controversion of the views of Stromeyer, and those who think with him. I am rather inclined to favor a hopeful and a progressive surgery, and, as my practice in the above case will show, to give the sufferer the chances of an operation in doubtful cases. The result of my venture in this particular instance, however, may be regarded as an argument against the doctrine I have accepted. The most reasonable conclusion is that my patient died from the operation. Whether he would have survived under expectant surgery is a matter only for speculation.

HOSPITAL NOTES.

HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

(Service of PROF. ASHHURST.)

URACHAL FISTULA.

(Reported by H. R. WHARTON, M.D., DEMONSTRATOR OF CLINICAL SURGERY IN THE UNIVERSITY OF PENNSYLVANIA.)

W. K., aged nine months, was sent to PROF. ASHHURST'S clinic by Dr. A. J. Marcy, of Riverton, N. J., and upon examination presented a flattened tumor about the size of a filbert, occupying the position of the umbilicus, it was covered with mucous membrane, and in its centre there was a depressed opening through which occurred a constant discharge of urine; there was no phimosis or other obstruction to the free passage of urine through the urethra.

The case was diagnosed as one of urachal fistula or patulous urachus, and an operation was decided upon for its relief.

The child was etherized, and a slender cautery iron heated to a dull-red color having been dipped into the fistulous tract, so as to destroy its mucous lining, a needle armed with a double ligature was passed through the base of the tumor, the needle was withdrawn, and the ligatures tied so as to completely strangulate the mass; which was then cut off below the ligatures, and the cautery thoroughly applied to the stump. The case was kept under observation for several days, when, as the patient presented no unfavorable symptoms, he was sent to his own home.

Several weeks after the operation Dr. Marcy reported that the slough had separated, that no urine had escaped from the fistula, and that the wound had healed, leaving an umbilicus normal in its appearance.

Remarks by DR. WHARTON: Urachal fistula is caused by a patulous condition of the urachus, which, it will be remembered, represents a tube in the embryo extending from the bladder to a pouch called the allantois, situated outside of the abdominal walls; this tube is obliterated in early fœtal life, and is recognized after birth as a band extending from the umbilicus to the bladder.

The patulous condition of the urachus is generally attributed to some obstruction to the free passage of urine from the bladder, as a narrowing of the meatus, complete atresia, imperforate prepuce or phimosis.

In addition to the annoyance caused by the constant escape of urine accompanying this condition, the formation of calculi has also taken place in the patulous urachus, as is shown by the case of Boyer, reported by Gross, and cases reported by Cabriol, Paget, Amussat, Vosburg, and Henriette. The number of reported cases of urachal fistula are few, and in many of the text-books on surgery the condition is not described.

Agnew[1] mentions a case of incomplete urachal fistula

[1] Agnew, System of Surgery, vol. i. p. 388.

in which the umbilicus became distended when urine was allowed to accumulate in the bladder.

Ashhurst[1] has seen two cases, and records five others seen by Guéniot, Jacoby, Rose, Charles, and Worster.

Gross[2], under the title of patent urachus, describes the condition and mentions several cases.

Bryant[3] mentions one case seen by himself, which was not subjected to operation.

The treatment of this condition consists first in the removal of any obstacle to the free escape of urine from the bladder, and if this should not accomplish the object, the fistula may be closed by a plastic operation, by the use of the ligature, by the application of the actual cautery, or, as in the case reported above, by the use of the ligature and cautery combined.

MEDICAL PROGRESS.

EXTIRPATION OF THE UTERUS BY THE VAGINAL METHOD.—DR. EUGENE HAHN gives in the *Berliner klin. Wochenschrift* his experience of this operation. He has performed it seven times, with two deaths. Five out of the seven were for carcinoma, and two for prolapse. One of the deaths was from peritonitis, and the other from bronchitis, with pelvic peritonitis and pelvic abscess, all of which conditions are stated to have been present before the operation. The following is the method of performing it practised by Dr. Hahn: During the twenty-four hours prior to the operation the vagina is repeatedly syringed with a five per cent. solution of carbolic acid. Shortly before the operation, if disinfection should not appear complete, the surface of the new growth is scraped, and a twelve per cent. solution of chloride of zinc is applied. The tumor is seized with broad toothed forceps, and, by incisions round it, is separated from the healthy tissues. Anteriorly the bladder is dissected off, and the peritoneum opened; and then posteriorly the peritoneum is opened in like manner. Then the structures contained in the right broad ligament are successively ligatured from before backwards. The ligatures are passed with an aneurism needle. The tissues between each ligature and the uterus are secured by catch forceps, then the ligature tied, and the tissues divided between the forceps and the uterus. This being done, two fingers are introduced into the peritoneal cavity, and the uterus seized, and then the left broad ligament tied and cut through in the same manner as the right. The uterus having been removed, and the ligatures cut short, the abdominal cavity is washed out with a one-third per cent. solution of salicylic acid, and all blood-clot is removed. The most minute care is taken to stop all hemorrhage. Then the speculum is pushed up until the intestine is visible, and iodoform is sprinkled over it, and then, the speculum being gradually withdrawn, the parts exposed are likewise dusted with iodoform. Lastly, iodoform gauze is put in the vagina. In from twenty-four to forty-eight hours the dressings are usually soaked with discharge. The gauze is then removed, the vagina gently syringed with lukewarm solution of salicylic acid, the parts again dusted with iodoform, and iodoform gauze put in the vagina. This is repeated every twenty-four or forty-eight hours for eight or ten days, after which the discharge commonly ceases.—*Med. Times and Gazette*, June 24, 1882.

NEUROSES ASSOCIATED WITH THE VAGUS NERVE.—After noting the frequency of cardiac irregularity from indigestion, DR. ROSENBACH records (*Deutsche Med. Woch.*, 1882, No. 12) a case of cardiac irregularity caused by the horizontal posture, and a case of temporary central paralysis of the vagus nerve. The patient in the first case was a prematurely old man, aged 55, who complained that, as soon as he lay down in bed, he had a feeling of præcordial anxiety, and usually awoke in great distress, with the hands cold and stiff. With the exception of slight anæmia, some signs of arterial sclerosis, and a slight emphysema, there was nothing abnormal in his condition. The digestive functions were normal. His pulse in the erect posture was 72, regular, and moderately full; but, on his assuming the recumbent posture, with the head low, it fell to 60 or 64, and became irregular and intermittent, all which characters disappeared almost immediately on his assuming the erect posture again. Dr. Rosenbach, considering that he had excluded all other possible causes, attributes this phenomenon to the change in the outflow of blood from the cranial cavity. This outflow being much less free in the horizontal than in the erect posture, as shown by the more rapid current in the veins at the root of the neck when the erect posture is assumed, he considers that in a patient with arterial sclerosis the tonus of the vagus and of the vasomotor nerves produced by the venous blood will cause retardation of the heart's beat, with increased arterial tension. The patient in the second case was a man, aged 31, affected with phthisis. While in hospital, he was attacked with vertigo and headache, his pupils being extremely narrow. Two days later he became insensible, breathing once, or, at most, twice a minute, while at the same time the heart was extremely frequent and tolerably full. Under artificial respiration, carried on for an hour and a half, the patient recovered. Each time the artificial respiration was stopped, the patient again ceased to breathe, and became cyanotic. That the vagus could still conduct impulses, was shown by the fact that electric stimulation with a strong current reduced the heart's beats from 156 to 100 or less, per minute. After the above period, Cheyne-Stokes's respiration set in, and for two hours longer the patient required to be roused occasionally. A month later, the patient died of tubercular meningitis. Dr. Rosenbach puts down the symptoms in this case to a central paralysis of the vagus, owing to a disturbance of nutrition in the respiratory centre of the medulla oblongata.—*London Med. Record*, June 15, 1882.

TEMPERATURE IN CARDIAC DISEASE.—A monograph upon the above subject has recently been published by M. SABATIER. His researches embrace the determination of the local temperature of the præcordia, as contrasted with the axillary temperature. He states the normal temperature of the præcordial region as 36.1°C. (about 97° F.), liable, however, to variations in different subjects. In pericarditis the axillary temperature is much raised in acute cases, but not influenced in chronic and subacute cases. The præcordial temperature is increased in acute and subacute pericarditis, but where there is much fever, as in acute rheumatism, the præcordial temperature is lower than the axillary. When the local inflammatory process is very intense this difference may be reversed. When right-sided pleurisy coincides with pericarditis, local thermometry indicates the relative intensity of the two inflammatory processes. During endo-pericarditis the local temperature does not subside so soon as the general. In endocarditis there is no local rise in temperature, a point of distinction from pericarditis. In cardiac hypertrophy the præcordial temperature is the same as, and sometimes lower than, that of the opposite side. Vesication applied to the præcordia keeps the temperature at a high level for several days. Numerous tracings are given and, although the subject is limited and, per-

[1] Ashhurst's Surgery, p. 937.
[2] Gross, Urinary Organs, p. 368.
[3] Bryant's Surgery, p. 484.

haps, hardly sufficiently fruitful, considering the labor expended upon it, it is the first contribution to local cardiac thermometry that has been made. The author believes that the method is a valuable aid to diagnosis, and that the local temperature of the cardiac region should always be estimated. It is of most importance at the close of the acute period, when the axillary temperature has become normal.—*Lancet*, July 1, 1882.

THE TREATMENT OF ERYSIPELAS.—DR. HASTREITER recommends the treatment of epilepsy by painting with oil of turpentine, on the following grounds:

1. It can be employed on the most sensitive patients, does not require any skill, and can be applied by the patient himself as often as may be necessary, and the irritation produced by excessive friction is avoided. During its application the eyes should be protected by a pad.
2. When employed frequently enough this method is perfectly safe, and tends to produce a rapid cure.
3. Oil of turpentine can be procured everywhere.
4. All other dressings are unnecessary.
5. Internal antipyretic treatment is only rarely necessary; usually all that is necessary is to bathe the body with cold water, and to make use of cold applications to the head.
6. The inhalation of the vapor of turpentine can perhaps act as a preventive of the extension of the disease to the air passages.
7. When employed at the outset of the disease it may abort the morbid process.
8. The oil of turpentine may also be employed in phlegmonous inflammation other than erysipelas.—*Wiener Med. Presse*, June 18, 1882.

CHARACTERS OF THE URINE IN YELLOW FEVER.—DR. CULBERTO PENA (*La Escuela de Medicina*, Mexico, Feb. 15, 1882) publishes a series of observations which he has made on the condition of the urine in yellow fever. In nine cases in which the vomiting was present, albumen was only found in one, and then in very small quantity. In the course of an epidemic that he had the opportunity of observing, albumen was absent in one-quarter of the mild cases and in thirty-seven per cent. of the grave cases. The reaction was nearly always acid, being alkaline or neutral in only four per cent. The color was variable, being at first clear, but becoming turbid during the course of the disease. Bile pigments are not present as a rule, being only met with twice in two hundred examinations.—*Journ. de Méd. de Paris*, June 24, 1882.

PORRO OPERATIONS.—The last case reported was that of Dr. Dozzi, of Italy: operation performed on March 10, 1882. The subject was a dwarf, 28 years old, measuring in height (79 cm.) only 31⅛ inches, and having a deformed pelvis. The membranes had been ruptured eight or nine hours when the section was made; the fœtus was delivered alive but died before the operation was concluded; the woman died of shock in 24 hours.—*Gaz. Med. Ital. Prov. Venet.*, No. 22, June 3, 1882.

This case gives Italy 36 operations, with 22 deaths and 14 recoveries. There have been in all 91 operations, as far as reported, with 38 recoveries.

Ignatio Cataliotti's Case.—This was first reported from Italy as the work of Dr. Camminiti, of Messina. Dr. Cataliotti operated at Palermo, on October 28, 1880, on a woman 40 years of age, affected with a large fibro-myoma of the uterus, and ascites; the fœtus was delivered alive, and the woman recovered.—*Stamperia Militare*, 1882.

Dr. Negri also reports a case under the head of "*Bayer*," of Stuttgart. Our tabular record shows this operation to belong to Prof. Fehling, May 4, 1881; the woman and child were saved. Operation performed after the modification of Müller.

Dr. Marchand, of Paris, has performed Prevôt's operation, *i. e.*, the amputation of the uterus through the cervix and its removal, in a case of rupture of the organ in labor. The child was dead, and the woman died of peritonitis. This method has not yet saved a case of rupture. The uterine suture promises much better results. Let the abdomen be thoroughly cleansed of blood, and the uterus well sutured with silver wire or pure silk, at short intervals, along the whole line of the laceration.

A CASE OF PHLEBECTASIS.—RIEDEL (*Centralb. f. Chir.*) reports the case of a man 42 years old, always healthy, member of a family in which apoplexy frequently occurred, who acquired in the course of two or three months a stupid expression of countenance, with, later on, determination of blood to the head, rushing sounds in right ear, giddiness on stooping, and troublesome burning of face. A few days later there was well-marked facial cyanosis, especially on the right side. The veins of the chest on the same side were full and distended, and at the anterior border of the axilla a tortuous varicose vein was visible. In the right supraclavicular fossa there was a tumor the size of a hen's egg, from whose upper margin the dilated external jugular vein ran upwards. Pressure on this non-pulsating tumor caused it to disappear, whilst the patient experienced loud rushing noises in the ear. On cessation of pressure, the tumor, whose lumen could be traced for some distance into the chest, resumed its former size. There was a similar, though much smaller, tumor on the left side. The heart and other organs were found to be normal. Under daily injections of ergot the swellings rapidly disappeared, becoming flatter and harder, and the subjective symptoms ceased. As a central obstruction of the circulation may be excluded, Lindner is inclined to regard a chronic phlebitis, specially localized in the neighborhood of the valves, as the cause of the symptoms described. Owing to this process the venous walls become affected in such a manner that they give way under the moderate pressure of the blood-stream, retarded somewhat by the altered valves.—*Edinburgh Med. Journ.*, April, 1882.

THE CAUSES OF THE NORMAL JUGULAR PULSE.—M. FRANÇOIS-FRANCK has communicated to the Société de Biologie (*Journ. de Méd. de Paris*, No. 11, 1882) the results of his experiments upon the production of this phenomenon. He finds that, when pericardial aspiration is excluded by opening the thorax, it persists; it persists, also, when the communication is momentarily interrupted between the right ventricle and the right auricle, and when the ventricular systole is stopped by irritation of the vagus. It disappears when the systole of the auricle is produced by mechanical irritation or other means, and when the systole of the auricle is displaced, so as to occupy a phase of the diastole. The venous pulse is also displaced. All these facts tend to the conclusion that the normal jugular pulse is produced by the systole of the right auricle.—*London Medical Record*, June 15, 1882.

RELATIONS OF GELSEMIC ACID AND ÆSCULIN.—PROF. WORMLEY, in a series of careful experiments, conclusively refutes the assertions of Sonnenschein and Robbins as to the identity of these two principles, and he gives results from which it would appear that in gelsemium poisoning evidence of the poison in the blood may be more readily and fully obtained than in the case of any of the other vegetable poisons.—*Amer. Journ. of Pharm.*, July, 1882.

ACUTE DILATATION OF THE HEART.—DR. M. HEITLER has, in recent numbers of the *Wiener Medicinische Wochenschrift*, touched on a subject of great importance. A sudden or rapid dilatation of the heart does certainly occur under many circumstances; but we think it is necessary to draw a distinction between different forms. There is that which happens in connection with many acute exhausting diseases, such as puerperal fever, typhoid fever, pneumonia, and so forth; and of this nature, or something akin to it, is probably the dilatation which is met with in chronic anæmia. In all these cases there would seem to be undoubted change in the structure of the cardiac muscular walls. But the question is whether we cannot have a dilatation of even more rapid arrival, and which, consequently, can hardly depend on universal softening of the heart's musculature; whether, in fact, "idiopathic dilatation" can occur. Dr. Heitler seems to have observed cases which must come under this division. He talks very confidently of rapidly appearing and as rapidly disappearing enlargement. This he has demonstrated in chronic valvular disease. We are inclined to agree, and think that the remarkably sudden variations in the health of sufferers from chronic cardiac maladies may here find an efficient explanation. Truly acute dilatations of the heart are believed to occur in soldiers during campaigns, and in persons strenuously exerting themselves physically. Dr. Heitler has no experience of such cases. Some authors have taught that such rapid enlargements may ensue on nervous exhaustion, resulting from debauchery and sexual excess. It is possible also that the sensations and illness of amateur mountaineers may be due to the same state. To the symptoms, physical signs, and differential diagnosis of dilatation, Dr. Heitler adds no new knowledge. In treatment, great confidence is placed in digitalis. Further, Dr. Heitler believes that percussion, such as is practised in ordinary physical examination, is capable of bringing about a diminution in the size of the heart. If such occurrences do happen, then it would seem quite certain that we have to do with a reflex action; and inherently there is no improbability. Goltz long ago showed that the frog's heart could be stopped in diastole by tapping the epigastrium, and why should not a contraction be brought about in a reflex manner? Moreover, it may be that any external application whatsoever, such as mustard plasters, act in this manner. We have not yet got at the bottom of reflex actions as a mode of treatment, and we can heartily recommend our readers, if they have not already done so, to study Dr. Lauder Brunton's article on this subject. On so-called "idiopathic dilatation," authors' beliefs are still conflicting. The subject has been treated very fully, indeed, by Seitz, who strongly urges the fact of its occurrence. Schrötter holds the opposite view.—*Medical Times and Gaz.*, July 1, 1882.

A CONVENIENT METHOD OF DEMONSTRATING THE BACILLI OF TUBERCLE IN SPUTA.—BAUMGARTEN gives the following method of staining tubercle bacilli, as easier and more expeditious than those recommended by Koch or Ehrlich. Dry preparations of the tubercular sputa are prepared according to Koch's or Ehrlich's method, and moistened with a very dilute solution of potash; the bacteria can then, without further treatment, be readily detected with a power of 4–500 diameters. Slight pressure on the cover slip will serve to bring them out more clearly. In order to distinguish the bacilli of tubercle from other species, the cover slip is removed from the slide, and laid to one side until the moisture on its under surface has dried off; it is then passed two or three times through the gas flame, and then moistened with a drop of dilute anilin violet or other nuclei-staining anilin color. Now, under the microscope, the putrefactive bacteria are stained a deep-blue, while the tubercle bacilli remain perfectly colorless, as when in the potash solution. The entire process need only require ten minutes, and is, therefore, to be recommended for general use.—*Centralb. f. d. Med. Wissen.*, June 24, 1882.

TREATMENT OF HEMORRHAGE FROM THE PALM.—DR. RANDOLPH WINSLOW gives the following as expressing his conclusions from a study of this subject:

1. Hemorrhage from the palm should be treated by ligating or twisting the bleeding vessels *in situ*, when this can be done without undue disturbance of the tendons and other tissues.

2. This being impossible, compression should be applied in the wound by means of a graduated compress or conical cork, flexion and pronation of the arm being also employed, or the hand may be bound tightly over a ball of wood or cord.

3. Acupressure may be used to the radial artery, but it is not safe to compress the ulnar in this way, as the nerve is in close proximity on its inner side.

4. Other measures failing, ligation of the main vessels should be performed.

5. Owing to the frequent anomalies of the brachial artery, it is better to ligate the radial and ulnar immediately above the wrist, than to tie the brachial itself.

6. The hand should be wrapped in cotton wool, fixed upon a splint, and placed in a sling.—*Maryland Med. Journ.*, July 1, 1882.

INTRA-CRANIAL DISEASE AND CHOKED DISK.—DR. EDWARD G. LORING contributes to the June number of the *New York Medical Journal and Obstetrical Review* an article on the nervous connection between intra-cranial disease and choked disk, the conclusions of which are: 1. That the vaso-motor theory, as advanced by Benedikt, is not sufficient to explain either the mode of transmission of the morbid irritation within the head, or the resulting neuritis optica. 2. That the irritation is conveyed, not by the isolated fibres of the sympathetic system, as stated by Benedikt, but through the agency of the trigeminus. 3. That choked disk or papillitis, in connection with brain disease, is the expression of an irritation or compression of certain intra-cranial fibres of the fifth pair which preside over the blood supply of the disk and neighboring parts, and also maintain the healthy processes of waste and repair of the tissues themselves. This being so, he adds, the same analogies and distinctions between "irritation" and "inflammation" can be made here as with sympathetic ophthalmia, so that here, as well as there, the irritation may exist as such for an indefinite time, or may so reduce the vitality and resisting power of the tissue of the disk and surrounding parts as to develop gradually, or explode suddenly, into an actual inflammation—that is, into a neuritis. The immediate and exciting cause of this neuritis may be either an external one, such as exposure to cold or heat, over-exertion, either mental or physical, or, indeed, too much exposure to the light, the effects of which, under the weakened condition of the organ, may be looked upon as a "traumatism;" or the exciting cause may be an internal one, such as some irritation from the condition of the blood and circulating fluids, either chemical or mechanical, either local or general, which insufficient in itself to produce any bad effect upon a normal disk, may yet be just sufficient to produce a condition of inflammation in a part that is weakened and irritable.

ANTISEPTIC NEPHRECTOMY BY ABDOMINAL SECTION; RECOVERY.—MR. F. B. ARCHER reports the following case: M. E. A. L——, a widow, aged fifty, was ad-

mitted into the General Hospital, Bridgetown, Barbadoes, West Indies, on September 13, 1880, under my care. She had had five children. The menses stopped about eight years ago, soon after a fall, which fractured one of the lower ribs on the right side. While ill in bed, suffering from this, she observed a lump about the size of her fist on the right side of the bowels. This lump has never disappeared, but has slowly grown to its present size. It has caused her no particular trouble, but she has lost flesh. Her appetite and general health are good. She has never been tapped. Ten months ago she was in this hospital, and an ovarian cyst was diagnosed, and an operation advised. This she declined, and returned home. She now begs to have something done. Urine contains a little albumen. On microscopical examination no casts are seen. Temperature normal.

On September 14th she was put under chloroform and then ether substituted. Under a spray of carbolic acid an incision was made and a good many adhesions broken down. The cyst seemed matted to the right kidney, and on attempting to clear it the weight of the cyst tore the kidney, and considerable hemorrhage occurred. A clamp was put on, a ligature applied, and the kidney and tumor removed. It contained eighteen pints of fluid, and the cyst itself weighed five pounds. The patient was in a great state of collapse. A drainage-tube was inserted and the wound closed. She vomited five times after the operation, complained of great shortness of breath and pain in the head.

On March 14, 1881, she left the hospital quite well. By the last account she was enjoying good health.

Mr. Knowsley Thornton, through whom the notes are forwarded for publication, remarks that this is one of the best cases of nephrectomy yet published, due regard being paid to the quantity of fluid contained in the cyst, and the weight of the latter, the age of the patient being also taken into consideration. Convalescence, however, was very slow.—*Lancet*, July 1, 1882.

THE ABSORBENT ACTIVITY OF THE STOMACH.—A recent number of the *Berliner klin. Wochenschrift* contains an article by Prof. Penzoldt and Dr. Faber (Erlangen), which is an attempt to place at our disposal a new means for diagnosis of diseases of the stomach. The observations were made with the idea of determining whether the activity of absorption of soluble substances varied in any regular manner with different affections of the stomach. The investigations were conducted thus: The observed swallowed a gelatine capsule loaded with solid iodide of potassium, which when it arrived in the stomach was there dissolved and absorbed, and partly reappeared in the secretion from the salivary glands. Some saliva was then tested at intervals by means of starch papers and fuming nitric acid. At first a red, later on a blue, coloration was developed. In healthy subjects from seven to fifteen minutes elapsed ere the blue color was fully obtained. Some experiments on sufferers from (1) ulcus ventriculi, (2) dilatation of stomach, and (3) ill-defined gastric disorders, were made, and the results compared with those got from healthy individuals. So far the results are of no practical value.—*Med. Times and Gazette*, June 24, 1882.

PAROXYSMAL HÆMOGLOBINURIA.—BOAS (*Centralb. f. d. Med. Wissen.*, No. 20, 1882) reports a case of paroxysmal hæmoglobinuria, and deduces from its study, and of two other cases previously published, the following conclusions:

1. Paroxysmal hæmoglobinuria is a distinct disease, *sui generis*, and can be sharply defined from other forms of hæmoglobinuria.

2. The access of paroxysmal hæmoglobinuria is always attributable to the influence of cold, especially on exposed parts.

3. The intensity estimated by the coloration of the urine and the general symptoms, is directly proportional to the severity and duration of the chilling.

4. The spontaneous attack and those produced experimentally, are absolutely identical.

5. The fundamental change lies in the destruction of the red corpuscles with the passage of the hæmoglobin into the plasma; the general symptoms are only the consequence of this alteration.

6. This distinction is limited to the parts directly exposed to the action of the cold, though, of course, the products of disorganization are carried to all parts of the system.—*Gaz. Méd. de Paris*, June 10, 1882.

EXAMINATION OF THE EAR.—M. GEILÉ (*Progrès Méd.*) has made an experiment of great clinical value; it permits, in certain cases of defective hearing, to locate the lesion and to recognize abnormal action of the stapes and of the apparatus of accommodation. A vibrating tuning-fork is placed upon the frontal eminence of the patient; in his ear is fixed a tube of rubber whose other extremity, closed by a diaphragm of gold-beater's skin is placed to the ear of the observer; this otoscope has inserted at its middle an insufflating bulb.

The apparatus being arranged, the vibrations of the fork follow the cranial bones and are transmitted to the tympanic membrane. The patient perceives a sound which is transmitted by the vibrations of the tympanic membrane and of the air of the tube to the ear of the observer. If now, by the aid of the bulb, the tension in the tube be augmented, that is, if the membrana tymyani of the patient be compressed, his accommodative apparatus, which has lost its integrity, will perform its functions abnormally, the stapes will penetrate more or less in the fenestrum ovale and the sound of the tuning-fork will no longer be the same for the patient and for the observer; the lesion can be immediately localized in the apparatus of accommodation.—*St. Louis Medical and Surgical Journal*, July, 1882.

STRETCHING THE INFRA-ORBITAL NERVE.—COPPEZ (*Ann. d'Oculistique*, Feb. 1882) succeeded in curing a neuralgia of twenty years' duration by stretching the infra-orbital nerve. The neuralgia had been periodic for fifteen years, but for the last five had been almost continuous, and entirely interfered with work. The supra-orbital was also affected, apparently as severely as the infra-orbital, and it was intended to stretch it as well if the first stretching had not succeeded. Immediately after the operation the zone comprised between the nose and middle of the cheek, the half of the upper lip, and the mucous membrane covering it, were completely anæsthetic. The sensibility began to return three days afterwards, and was complete after five days. A little more than two months had elapsed since the operation, without the return of the slightest pain.—*Edinburgh Med. Journ.*, April, 1882.

FIRST CASE OF GASTRIC RESECTION FOR CANCER OF THE PYLORUS PERFORMED IN ITALY.—This operation was performed at the Surgical Clinic of Genoa, on June 14, 1882, by PROF. AZZIO CASELLI, upon the diagnosis of Prof. Maragliano, of "partial stenosis of the pyloric orifice, the result of a carcinomatous neoplasm." The operation was completed in two hours. The elliptical mass removed measured four and three-quarters by four inches. The woman died of shock on the evening of the day of the operation.—*L'Independente*, July 5, 1882.

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CHOLERA INFANTUM.

As the season for cholera infantum is at hand, it may be useful to lay before our readers some recent experiences in its treatment. Certain points in its pathogenetic development require statement as a motive for the proposed therapy. The influence of diet, especially the ill-effect of a diet largely composed of starch, is too well known to require further expression. But behind and beyond the personal hygiene of the child, there is an important factor which has been entitled "*civic malaria*"—the sum of those causes of pollution arising out of the evil hygiene of towns and cities.

The mechanism of those forces by which cholera infantum is produced is probably as follows: The bad air (germs?) depresses the function of the splanchnics, the inhibiting nerves of the intestinal canal, as the pneumogastrics are for the heart. Prevost demonstrated that ablation of the spheno-palatine ganglion caused a profuse outpouring of serous fluid from the Schneiderian mucous membrane. The depression of the splanchnics probably has a similar effect on the vessels of the intestinal mucous membrane. This disturbance must necessarily be aided by the fermentation of the starchy aliment, taken in excess. High febrile heat and an algid condition will follow the former at the onset of the disease, the latter after persistent outpouring of fluid from the intestinal mucous membrane. The obvious indications are:

To check fermentation, and to destroy the minute organisms or germs on which every fermentation must depend for its development;

To allay irritation of the end organs of the splanchnics in the mucous membrane;

To arrest the outward osmosis from the vessels;

To lower the febrile temperature, and to remove the algid condition.

These indications must be grouped to be dealt with effectively. The three first given must be considered together as objects to be accomplished simultaneously. To stop fermentation by destroying the organisms necessary to the process, involves under these circumstances the use of remedies to restore the functions of the splanchnics. A most useful agent to check the nausea and vomiting is carbolic acid, which may be given in an emulsion with bismuth and a little glycerine. Remarkably good results are obtained from the use of potassium bromide in many cases, if given early enough. Nitric acid, well diluted in small doses, frequently repeated, is an efficient remedy in other cases. In still others, pure Cognac brandy renders an incontestable service. Calomel in minute quantity—from $\frac{1}{20}$ to ^{1} grain—has a place in the treatment of nearly all cases. Are there any definite indications for the employment of these remedies? We believe there are. Carbolic acid alone, or mixed with bismuth, is the appropriate remedy when there is a high degree of irritability, food being rejected as soon as swallowed, or in those cases characterized by the rapid fermentation of the foods in the stomach, resulting in the production of acid. Bromide of potassium is particularly indicated when, with high irritability of the stomach, there are restlessness, wakefulness, twitchings of the muscles, and fever. Whilst the bromide does not materially modify the morbid condition of the stomachal and intestinal mucous membrane, it does allay the irritation of the splanchnics and of the nervous system generally. Nitric acid is remarkably useful when the stools are acid, watery, and without any undigested aliment. It stops the fermentation which produces the acid, and it stimulates the flow of bile. It does more; it solicits the osmosis of the alkaline constituents of the blood into the intestine, and thus restores the proper alkalinity of the intestinal juices. Those who find it difficult to comprehend such an action will be enlightened by a study of the laws of diffusion or osmosis.

Brandy to be useful must be administered freely. It is not as a stimulant merely that it is to be given in this malady. Alcohol is a powerful antiseptic; by its oxidation, force is evolved; and brandy contains astringent matters. It is indicated when the depression is pronounced, when the derangement in the digestion and assimilation of food is due less to the deficiency in the juices, than to the depression in the function of the splanchnics. Brandy, of course, increases in importance as a remedy with the approach of the algid condition.

The *rôle* of calomel as a remedy has been warmly

discussed. Correct notions as to its action, and its proper place as a remedy, are gradually crystallizing out of the mother-waters of experiment and clinical observation. Formerly, the central idea of its administration was "to alter the secretions," this phrase including the biliary and intestinal. Without occupying space in discussing controverted questions, when we have room for merely a dogmatic statement, we will give an expression to the best-founded opinion. Calomel in small doses acts as a *sedative* to the gastro-intestinal mucous membrane, allays vomiting, and checks fermentation. Although the modern view is against the action of calomel on the biliary secretion, it seems to be well established that it does act on the intestinal glandular apparatus, and increases the elimination through them of the products of waste. Judiciously used then, in the small doses above mentioned, there are few cases of cholera infantum in which calomel may not be beneficial.

We have yet to discuss the treatment of the febrile state, and of its corollary, the algid. The condition of the gastro-intestinal mucous membrane precludes the administration of the ordinary antipyretic remedies. In many cases the range of febrile heat is great, the maxima of the thermal range encroaching on the danger line. Indeed, in cholera infantum, it is probable we have to deal with a specific fever. Besides acting on the causes of the febrile heat it becomes necessary to restrain the body temperature within proper limits. The development of hydrotherapy by our German *confrères* has led to a most useful application of the practice to cholera infantum. With the thermometer as a guide, the child should be immersed in water at 95° Fahr., and the bath then cooled to 75°, 70°, or 65°, according to the temperature of the body and the influence of the bath—cooled by the addition of sufficient cold water or of ice. Such is the general idea; our space is not sufficient for details. The time for the repetition of the bath cannot be arbitrarily stated, but it must be determined by the effect produced on the temperature. The influence of the bath is most conspicuous for good. Its value as a remedy for this condition can hardly, indeed, be overestimated.

The algid stage of cholera infantum offers the same difficulty in its management that the corresponding condition in cholera does. As regards the exhibition of alcoholic stimulants, it should be borne in mind that small doses frequently repeated will support the failing circulation, when large doses will have the opposite effect. Belladonna, or its alkaloid, atropia, is a powerful stimulant to the heart, which has been used with advantage in the algid condition. Nitro-glycerine will probably prove useful in the same condition by dilating the peripheral vessels, and thus permitting the heart to work under lessened pressure.

We have barely mentioned the subject of alimentation. The character of infant foods, and their relation to the subject under consideration, is too important to be dismissed in a few words. We therefore close the consideration of the medicinal management of cholera infantum, reserving for future discussion the questions connected with food and alimentation.

PRESIDENT GARFIELD'S CASE AGAIN.

THE carefully prepared article of Dr. Baker which we publish in this issue constitutes another contribution to the ever-increasing literature of the Garfield case, the surgical problems of which, not only from the fact that they involved an illustrious life and the destinies of a nation, but also from their intrinsic importance, have possessed unusual interest for both the profession and the laity.

Dr. Baker has analyzed, in a painstaking manner, the evidence given at the Guiteau trial relative to the positions of the assassin and his victim, and makes therefrom several deductions as to the probable course of the first and of the second shot, concluding that it was the latter which proved fatal. It is not apparent how this affects the general proposition that a knowledge of the positions of the parties and of the course of the ball, until it struck the eleventh rib, could have been of little value in determining its further direction, or might even have led to an erroneous conclusion. Whatever arguments are urged as to the possibility of inferring the direction of the bullet after its contact with the ribs from its known course before it entered the body, are very much weakened by the extremely erratic course which missiles so often take after impinging upon resistant and resilient bodies like the floating ribs. Whether the President was turning to the left or to the right when he received the fatal wound, and whether it was the first or the second bullet which caused it, are questions of historic interest and also of dispute. We believe, however, that there is no dispute as to the general direction of the ball in its course from the muzzle of the pistol to the wound of entrance. There can be no doubt, and so far as we know it has not been questioned, that if *that* line were continued it would lead downward, forward, and to the left; but that without deflection it would represent the actual course of the ball, or that the surgeons, even if they had been familiar with all the facts which the Government, after the labor of months, and an exhaustive examination of a large number of witnesses, was able to elicit upon the trial, would have been justified in assuming that the missile had proceeded in that direction, we believe to be incapable of demonstration.

Dr. Baker does not allude to the fact that a line carried from the point of fracture in the twelfth rib, through that in the eleventh rib, and prolonged until it reached a point six feet behind the President, would have attained an elevation, which, allowing for all possible positions of the two ribs, would still have been far above the head of the assassin, or, in other words, several feet above the level at which he held the pistol. It is this *vertical* deflection which was described in Dr. White's article—to which Dr. Baker's is a reply—and all the testimony shows that at the time of the second shot the President was still standing erect.

It should be remembered, too, that, apart from these considerations, Dr. Baker's argument as to the surgical value of a knowledge of the positions of the parties depends entirely upon the literal exactness of witnesses who testified after a considerable lapse of time to the minute details of circumstances occurring during a scene of great excitement. If the muzzle of the pistol varied materially from the direction in which he believes it to have pointed, the whole problem from his point of view would necessarily be changed. In view of all the facts that the evidence as to the position of the parties, which was presented to the surgeons called in attendance immediately after the shooting, was that the first shot was the one that took effect, and that at the time the President was turning to the left, it seems to us that there is hardly sufficient basis upon which to build so elaborate a theory as Dr. Baker has presented.

As to the possibility of a diagnosis from the subjective symptoms, there can be no doubt that scores of such "snap diagnoses" were made all over the country, but there is also no doubt that the symptoms, singly or collectively, were insufficient to warrant them. The pains in the limbs—only symmetrical in the sense of being bilateral—were of unequal severity on the two sides, and had largely disappeared on the left side forty-eight hours after the shooting; in the absence of any loss of power, they had little value as a diagnostic sign of spinal injury, and could be accounted for as well without as with such a lesion.

Certainly no conservative surgeon would have allowed himself to be influenced by some of the additional arguments which Dr. Baker advances in support of this theory. Pain on one side of the scrotum; vomiting, extremely common after all gunshot wounds; a thready pulse, indicating hemorrhage, which, as the vessels lie near the spine, must have come, according to Dr. Baker, from that locality; the absence of paralysis; "daily evacuations," etc., can hardly be considered as pathognomonic symptoms of spinal injury.

The exact nature of the change in the splenic artery which led to its rupture, the immediate cause of death, will doubtless always be a matter of conjecture, but in the absence of any more plausible theory, with which Dr. Baker does not seem to be provided, we may assume that it was in one or the other of the ways already suggested in Dr. White's article.

The anatomical point Dr. Baker raises, based on the relative course of the ball and the artery, seems to be well taken. But here, again, he has misunderstood the situation. If the artery had been wounded at the time of the shooting, it does not follow, of course, that the aneurism developed immediately. It might have been the result of slow inflammation of the coats of the vessel. No one supposes that the false aneurism—the actual rupture of the coats of the vessel—took place earlier than about the time the President went to Elberon, or that it "existed eighty days," as Dr. Baker puts it. The reason for this opinion was given in the paper just referred to.

The cases quoted by Dr. Baker, in support of his opinion that the wound was not necessarily mortal, although not new, are interesting, but are not analogous, neither of them having been a *perforating* wound of the vertebra. In the first case, the injury was a penetrating wound, the circumstances of which, in regard to the opening of venous sinuses, the splintering of bone, etc., are always very different from those in which a ball inflicts the additional damage incident to a wound of exit. The clinical history also is very indefinite. In the second case, the wound of the body of the vertebra was merely a groove in its surface, and it may be said in addition, that to diagnosticate the position of a bullet in the left side of the body of a vertebra by digital examination made through a wound on the right of the spine appears to be incompatible with the usual length of the human finger.

Moreover, it has not been denied that a vertebra may be wounded and recovery follow, that a bullet may be imbedded in it, or that its body may be grooved without fatal consequences. Such cases, though uncommon, are not of exceeding rarity. They are by no means parallel, however, with that of President Garfield, in which the body of the vertebra was *perforated*, and it is unquestionable that no authentic instance of recovery after such a wound as this has ever been recorded.

We have been impelled to make this brief review of the points in Dr. Baker's paper, not from any desire to re-open an argument which we had hoped was permanently at an end, but because, recalling with regret the unjust newspaper criticism which has prevailed throughout the country, and, with indignation, the recent indecent tirades in Congress, we feel it our duty, for the sake of medical science

and for the honor of the profession, to take every opportunity of asserting our unchanged belief in the wisdom of the course pursued by President Garfield's surgeons.

SENATOR CAMERON'S JOINT RESOLUTION.

AN interesting correspondence has taken place between the Chairman of the Committee on Medical Legislation of the American Institute of Homœopathy, and the heads of the medical departments of the army and navy, through the medium of Hon. Charles O'Neill, M. C.

The homœopath wrote to ascertain if the Secretary of the Navy authorized any discrimination between the diplomas of homœopathic medical colleges in good legal standing, and "those of the allopathic, or so-called 'regular' school," in the admission of candidates to examination for the medical corps. He also wanted to know if a graduate of a regular medical college who avowed his belief in homœopathy would be considered eligible. He made the same inquiries in reference to the medical appointments of the army.

From Mr. Chandler, Secretary of the Navy, he received a reply stating that no discrimination was made in favor of or against any school. "The only requirements of the department are that a candidate, in addition to his moral and physical qualifications, shall possess the necessary professional and literary knowledge to enable him to pass the established examination." Certainly a most cautious and conservative answer, but one which, if we read between the lines, offers very little hope to the discontented applicants. We believe, after some opportunity of careful observation, that any fair-minded and impartial board of examiners acquainted with the exigencies of the service, and knowing the responsibilities which may at any time devolve upon the naval surgeon, would be compelled to reject, for lack of "necessary professional knowledge," applicants who had received their medical education at homœopathic colleges.

This assertion, which we make unqualifiedly, is founded not on a disbelief in therapeutic dogmas, but on positive knowledge of the radical defects in the character and methods of teaching the elementary principles of medicine—anatomy, physiology, etc.—which prevail in such institutions.

Whether it is proper to place the lives of the officers and men of our army and navy in the care of irregular practitioners is another question, and in this respect the very manly and straightforward letter of Surgeon-General Barnes meets with our entire approval. After calling attention to the fact, so commonly misunderstood by the laity, that the term "regular," as applied to a medical school, has no relation to its legal standing, but merely indicates that its teachings are not confined to the doctrines of any particular sect, he adds that the knowledge which a medical officer of the army should possess to enable him properly to perform his duties can only be obtained at a regular medical school, and that "it is not considered worth while to waste the time of the army medical examining boards or to induce young men to incur useless expense by extending invitations to appear before such boards to those who cannot furnish evidence that they have at least had an *opportunity* to obtain the knowledge required." An acquainance with the dogmas of any particular system of medicine would not prevent a candidate from being admitted, but an avowed adherence to some one of them would prove a bar to his admission, and we hope will always continue to do so.

The resolution of Mr. Cameron, however, to which we referred in our last issue, and which is so admirable an illustration of the depths of ignorance to which the "practical politician" descends when he permits his statesmanship to venture beyond the arrangement of primaries and the management of conventions, points in another direction. It must be humiliating to the petitioner of a "pathy" to find that in the minds even of their advocates no distinction is made between them and the rest of the army of "pathies"—eclectics, Thomsonians, mesmerists, botanists, and all the other quacks who have succeeded here and there throughout the country in obtaining legislative recognition and in establishing "colleges." Mr. Cameron has doubtless no serious idea that his resolution will prevail; but if he hoped by it to secure the votes of these irregular practitioners for himself or his candidates, he should have been more select in his bestowal of privileges. At any rate, each of the "exclusive schools" will be able to excuse its failure, as Falstaff did his many defects: "Company, villanous company, hath been the spoil of me!"

SUMMER SANITATION.

IT would be well if all our other large cities should imitate the example of New York. The Board of Health, which has powers granted to few such municipal bodies by our legislators, appoints each year fifty physicians as Sanitary Inspectors, who for five weeks in July and August inspect the tenement houses of the city, report the grossest nuisances to be abated, prescribe especially for the sick children of the poor, and distribute tickets to the excursions given by the various charitable associations.

It would be well too in the interest of the sick children, and especially of sick infants, if the example of the Philadelphia Board of Health were

followed. At their instance the Philadelphia Obstetrical Society formulated a few simple rules for the management of sick infants in hot weather. These suggestions were printed in the newspapers and in cheap pamphlet form, and are distributed every summer in drug stores and through physicians gratuitously to all who would take them. Many a life we doubt not has been saved by their observance; and many a mother has got her first and much needed lesson in hot weather hygiene from these admirable rules.

We note also with pleasure the sanitary work of the Citizens' Sanitary Society of Brooklyn, and the New York Association for the Improvement of the Condition of the Poor. The recommendations they have made for the removal of sanitary evils are admirable, and the defects and abuses they have revealed have been surprising. Most surprising of all is the statement made by Mr. George C. Booth at the recent sanitary meeting at Greenwood Lake, that "the wealthiest and most prominent church corporation" in New York City has scores of tenement houses which are in the foul condition he describes so vividly, and that the church corporation exacted last May ten and fifteen per cent. increase of rent under pain of eviction, instead of spending some thousands out of its millions in remedying such monstrous evils.

SOCIETY PROCEEDINGS.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Stated Meeting, June 7, 1882.

W. S. W. RUSCHENBERGER, M.D., PRESIDENT, IN THE CHAIR.

DR. JOHN M. KEATING, read a paper on *The Presence of the Micrococcus in the Blood of Malignant Measles; its Importance in Treatment.*

He said: I propose to present for your consideration this evening the report of a recent epidemic in the Children's Asylum of the Philadelphia Hospital. The ward in which the disease first showed itself contained children between the ages of two and three years; some of them had been deserted by their mothers, and others had been placed there temporarily whilst the mothers were employed in duties about the establishment. For the most part, these children presented a fair appearance of health; they were seemingly well nourished, of good development, though probably they would have been classed as "strumous," if their large features and tendency to glandular enlargements and eczematous eruptions had received careful attention. Together with all children of this class living in asylums, they certainly presented an open field for the production of those complications that are usually such fatal attendants upon measles.

Dr. Formad examined almost daily the blood of each little patient, and together we noted the presence of micrococci in the malignant cases, and their absence in those of mild type. We entered this study with no preconceived views; the rapidity with which this exceedingly fatal epidemic came upon us, necessitated careful study in order to attempt, if possible, to discover its cause.

CASE I.—J. F., aged two years and three months, was taken sick April 12, 1882. There had been no cases of well-defined measles in the house at that time, although it was epidemic in the city. The child had a sore throat, some cough, with fever. The throat eruption was punctated and well marked. The child died in convulsions April 15, 1882.

Autopsy.—An ante-mortem (chicken-fat) clot was found in the right heart, extending into the pulmonary artery. There was great systemic venous engorgement. A decided staining was noticed upon the cadaver, especially about the temple, which caused the remark that the disease was probably one of the exanthemata. This child had been placed upon carbonate of ammonium, quinia, and digitalis; had had bromide of potassium, hot baths, and stimulants in small quantities.

CASE II.—M. J., aged three years and five months, was taken sick April 9, 1882. A slight eruption on the face was noted April 11, 1882; the next day the eruption was complete over the entire body. In this case the eruption was irregular, was decidedly that of measles, but of malignant type. Still she did well until April 17, 1882, when suddenly the breathing became harsh, and pulse was rapid. At 4.30 P.M. had an attack of suffocation with rapid, feeble pulse. There was general venous engorgement, the face and lips were purple; pulse growing more rapid. Hot baths with mustard and frictions were used, and carbonate of ammonium and digitalis given. It was suggested to bleed in this case, but the evidences of heart clot were so marked, and the child had exhibited so many evidences of malignancy at the onset, that baths were used instead. April 11, 1882, at 3 A.M. she was still growing worse despite treatment, and shortly after had a violent convulsion and died.

There was no autopsy permitted.

CASE III.—A. G., æt. sixteen months. Took sick April 15, 1882.

April 16th had prodromes of measles. The temperature and pulse ran as follows:

16th.— P.M. 102°.
17th.—A.M. 101°; P.M. 103°; pulse 180.
18th.—A.M. 102°; P.M. 103°; pulse 180.
19th.—A.M. 101°; P.M. 102°; pulse 160.
20th.—A.M. 101°; P.M. 102°; pulse 148.
21st.—A.M. 100°; P.M. 100°; pulse 180.

In this case no defined eruption appeared on the body, although there was a decided papular eruption on the uvula and anterior half arches of the throat. Whilst showing this case to the class we noted streaks of grayish membrane in the fauces. The child had decided bronchitis, and the voice showed that the laryngeal mucous membrane was also affected. This child was not at that time very ill. There was no question in our minds at the time that it was affected severely by the measles poison; that it was, in fact, another malignant case. It was carefully watched, the nourishment regularly given with quinia and iron daily, as was customary in all the cases.

On the 21st, the breathing was noted as peculiar (I shall describe it hereafter). An emetic was ordered of ipecac, fearing an accumulation of mucus from the bronchitis present, and also carbonate of ammonium and digitalis and hot foot baths were given. The child's intelligence seemed good, and it will be noted that the temperature was but 100°, while the pulse was 180.

At 8 P.M. a second attack of suffocation occurred, and the child died in violent convulsions. The venous engorgement was very marked.

Autopsy.—Ten hours after death. *Heart:* left side and valves all normal. *Right side:* a large ante-

mortem clot filling the cavity of the right ventricle, and extending into the auricle; a clot was also seen in the pulmonary artery. *Lungs:* left, normal. *Right lung:* at the base of this lung the lesions of pulmonary congestion were seen, especially where the lung approximates the diaphragm. *Intestines:* slightly congested and hyperæmic. *Mesenteric glands:* enlarged and infiltrated by simple congestion. *Kidneys:* normal. *Blood:* taken from the heart cavity as soon as it was opened and examined, showed micrococci in the liquor sanguinis and *in the white blood corpuscles.*

CASE IV.—J. F. McH., æt. 23 months. This child had a typical attack of measles. The eruption was rapidly disappearing, and desquamation had set in. April 21st the bronchitis seemed to be aggravated, the respirations were 36, and expirations seemed unusually prolonged. The breathing was noisy; the heart's action was rapid, pulse 148. Suddenly, in the evening, an attack of suffocation came on, which was relieved by an inhalation of nitrite of amyl. On the morning of April 22d the heart was beating 168; the venous engorgement was very marked, the jugular veins standing out like whip cords, the respirations were from 36 to 40, but the temperature was 99°. I saw the child at this time, and noted the gasping breathing, the feeble pulse, and the tumultuous action of the heart. There seemed to be capillary spasm, judging from the gasping breath, the imploring look which the child gave to all its attendants, and we at once gave an inhalation of *nitrite of amyl.* In a few moments it seemed relieved. The administration of carbonate of ammonium, digitalis, hot baths, etc., was rigidly adhered to. The child seemed confortable until 4.30 P.M., when it had another attack of milder character, though longer duration, and in it finally died of convulsions. It was observed, says Dr. Campbell in his notes, that the convulsion was not as severe as in the previous cases.

Autopsy, twenty hours after death.—Eruption not well marked. *Heart:* right ventricle contained a small ante-mortem clot. This clot was in the cavity of the ventricle, and did not involve the valves, either tricuspid or pulmonary. The left side of the heart was normal in every respect; contained no clot. *Lungs:* normal, with the exception of hypostatic congestion at both bases. The pulmonary and costal pleuræ of the left side were inflamed and adherent in some places. *Trachea:* inflamed and containing a tenacious mucous secretion. *Larynx:* inflamed and hyperæmic. *Liver:* normal. *Intestines:* Peyer's patches and the solitary and agminated glands infiltrated and hyperæmic. *Mesenteric Glands:* enlarged and infiltrated, they were about the size of a grain of corn. *Kidneys:* normal. *Spleen:* amyloid bodies enlarged until they presented almost the appearance seen in a tubercular spleen. *Blood:* taken from heart as soon as punctured. Micrococci were found in the liquor sanguinis and *in the white blood corpuscles, and they were mobile. In the corpuscles they were seen in great numbers in active movement of a vibratory or whirling character, and they appeared to have devoured the white cells.* No bacilli were seen.

CASE V.—J. McG., æt. 26 months. Ordinary case of measles. The eruption had disappeared on or before April 15th. *April 22d.*—Child restless; marked bronchitis; cough paroxysmal upon waking, especially after excitement; mucous râles coarse, and fine throughout lungs posteriorly; throat congested, and saliva at times tinged with blood. At this date the breathing was noted as noisy. Pulse 144, respiration 32, temperature 100°.

23d.—Mucous râles becoming general, and not limited to areas as heretofore; pulse 152; respirations 34; temperature 101°. In addition to the tonic and stimulating treatment, mustard poultices were applied to thorax, and hot baths frequently given. Carbonate of ammonium was given now, gr. ij, ever hour, and bisulphate of quinia by suppository, gr. ij, every three hours. In addition to this the child was given, as were all the others, milk and lime-water, beef tea, etc., at frequent intervals. In this case the frequent administration of small doses of syr. ipecac. was resorted to in order to relieve the secretion, which was abundant and tenacious.

23d.—Evening. Pulse was rapid, 160 to 170; temperature 102½°; breathing becoming labored and gasping (fish-like); venous stasis was becoming more marked. Increased the whiskey to about one ounce a day. The attacks of suffocation continued paroxysmally, the jugular veins stood out like cords at times. *Nitrite of amyl* gave immediate relief, but relapse soon followed; it was always followed by free emesis, which seemed to be in itself beneficial. About midnight a severe paroxysm came on, and with it a convulsion in which the child died. It had been suspected for some time that a heart clot was present. After death the venous engorgement was even more marked than before. This little patient was the first case whose blood Dr. Formad examined during life. The view of the fluid was photographed; *micrococci were found in great abundance, acting especially on the white corpuscles.* The blood was examined very shortly before the child's death, when the symptoms of heart clot had been fairly established, and the case declared hopeless.

Unfortunately, no autopsy was permitted in this case.

CASE VI.—F. M., aged 2½ years. This case ran a course as did the others, and I will only occupy time with a description of the post-mortem appearances. Eruption well marked on mucous membrane of buccal cavity, not so on cutaneous surface. Upon laying thorax open, lungs found to be anæmic, as far as arterial circulation was concerned, but dammed up with venous blood. *Heart:* normal in size and weight.

Right side contained a clot extending along the pulmonary artery for some distance; it was chicken-fat in consistence. *Left side:* normal. *Spleen:* congested; weight, four ounces. *Intestines:* along the small intestine could be seen a few Peyer's patches inflamed, and well outlined against the comparatively normal gut. The mesenteric glands presented a very good example of enlargement and infiltration; they looked like so many peas scattered throughout the mesentery. *Liver:* normal. *Kidneys:* normal. *Brain:* not examined. *Blood:* taken from heart cavity as soon as it was open, showed micrococci in the liquor sanguinis and *in the white blood corpuscles in abundance;* they were not mobile. A number of zoöglœa masses were seen.

CASE VII.—C. M., aged two and a half years. The eruption in the throat of this child was very well marked. A few crescentic points appeared in the temples, and the case rapidly developed malignant symptoms.

April 21.—Slight grayish suspicious patches of membrane are seated in the throat. The child is hoarse and there is much bronchitis.

22d.—Pulse rapid; respiration 28; breathing irregular. There is great general venous stasis, the skin dark and mottled. Dr. Formad examined the blood microscopically, and found it full of micrococci. He took a specimen sample for photography. Prognosis very unfavorable, as the child has fluttering heart and gasping breathing. Hot baths had been used freely with no success, so also salicylic acid, which had been suggested early in the disease. After consultation with Dr. Formad, the account of which I incorporate in the

summary, it was concluded to give at once ℥ij of whiskey, and repeat it every hour; milk was continued as the only other food.

24th.—Pulse, 144; temperature, 101°; respiration, 48. Circulation much improved. Venous engorgement relieved; breathing greatly improved. The child continued to improve during the day. At the end of the twenty-four hours it had taken six ounces of whiskey, and yet it showed no effects of alcoholism. At noon the pulse was 140; respiration, 36. 6 P.M. pulse, 132; respiration, 32. 11 P.M. pulse, 122; respiration, 26, and regular; breathing easy, though somewhat noisy, but not harsh.

25th.—A.M. temperature, 98°; pulse, 128; respiration, 26. P.M. temperature, 98°; pulse, 108; respiration, 24.

26th.—A.M. temperature, 98°; pulse, 96; respiration, 22. P.M. temperature, 98°; pulse, 104; respiration, 24. The respirations remained regular, and the child continued to improve. After the examination of the blood on April 30, owing to the relative increase of the white corpuscles, it was decided to give Fowler's solution of arsenic, gtt. ij, three times daily. The large doses of whiskey were kept up for three or four days, and gradually diminished.

I give Dr. Formad's reports, which he kindly wrote out for me, of the microscopic examination of the blood in the above case (examination made with a one-sixteenth immersion lens).

Examination April 22, 1882.—Blood full of micrococci (sphero-bacteria), affecting many of the white blood-corpuscles; also a large quantity of these fungi free and in various forms of grouping, mostly in zoöglœa masses. White blood-corpuscles are in increased quantity; precipitation of fibrine excessively marked under the glass.

24th.—Micrococci present, but in diminished quantity; white blood-corpuscles less affected; precipitation of fibrine less marked.

26th.—Micrococci very marked, yet principally in zoöglœa masses, and free in serum, but not affecting the white corpuscles, although the latter are in increased quantity; fibrine not noticeable.

30th.—Micrococci present; white blood-corpuscles still in excess, but not affected by micrococci. Red blood-corpuscles not readily forming rouleaux, having partly lost their biconcavity.

May 3.—Micrococci present in diminished quantity. White blood-corpuscles diminishing in quantity.

18th.—Still some few micrococci present; blood otherwise appears normal.

CASE VIII.—J. W., æt. eight months. *May 13.* P.M. Eruption appeared on fifth day. The temperature ran as follows:

May 13.—P.M. 100⅗°. A fever mixture was given during the day. Quiniæ et ferri citratis, gr. ij, every three hours.

14th.—A.M. 101⅖°; P.M. 102⅗°.

15th.—A.M. 101°; P.M. 103⅖°.

16th.—A.M. 101⅖°; P.M. 104°.

17th.—A.M. 101°; P.M. 102⅘°.

18th.—A.M. 102°; P.M. 103⅖°. The eruption fading, but leaving a purple stain and mottled appearance of skin. Catarrhal pneumonia or collapse probably exists, as the bronchitis is very extensive, the *râles* numerous, and subcrepitant. The blood examined under the microscope *shows micrococci in the blood corpuscles, but none free in the field. They are seen in great numbers.*

19th.—A.M. 100°; P.M. 103°. For the past two hours the child has been very restless, the breathing rapid and labored, and also spasmodic. No membrane on tonsils or fauces. Heart's action very rapid, venous stasis marked especially in the jugular veins. Gave hot baths (says Dr. Campbell's notes), and covered him with blankets, with some relief. Increased the whiskey to ℥ij every hour. In the evening gave an emetic. The child at night was breathing easier; friction sounds heard.

20th.—A.M. 103⅘°; P.M. 102°. At times the strangulation would seem imminent. The venous engorgement increased. and the child died in convulsions on the morning of the 21st. The post-mortem examination showed pneumonia and pleurisy with effusion.

21st.—A.M. 105°, death.

The following eight cases were all taken sick at once, and I shall simply give a general statement of them for the purpose of especially calling attention to the case of W. L.

J. J., aged four years; W. L., aged five years; E. C., aged three years, catarrhal bronchitis; W. W., aged three years; C. B., aged two years, catarrhal bronchitis; J. W., aged five years; J. D., aged five years; L. K., aged five years.

Of these *eight*, seven presented severe but nevertheless typical examples of measles, and their blood was carefully examined by Dr. Formad and found normal. The case of W. L., who was taken ill at the same time as the others, showed from the onset a malignant tendency, giving a record such as I have already described. Dr. Formad gave me the following as the result of the examination of the blood in this case, and I had frequent occasion of examining it with him myself. Let me say that as soon as the presence of micrococci was established, the child was placed upon ℥ij doses of whiskey every hour. Quiniæ et ferri citratis in citric acid, gr. ij, every three hours, friction to the extremities, and warm baths, with milk and beef-tea.

April 22.—A few micrococci seen in the field.

26th.—Again noted.

30th.—Micrococci still present, white corpuscles increased and marked precipitation of fibrine. *None were noted as having penetrated the corpuscles;* those that were found were simply in the serum. This child recovered, though every indication gave a very unfavorable prognosis.

In presenting this detailed report I desire to call especial attention to the following points, viz., the microscopic examination of the blood and the constant association of *micrococci* with the general manifestation of malignancy (a condition already well known), and the gradual but positive amelioration of all bad symptoms by treatment which was directed to the micrococci as the *fons et origo* of trouble (this, I believe, for the first time exhibited).

It will be noted that the *post-mortem* examinations of these cases showed more or less simple pulmonary congestion, and at times simple enlargement of the glands, but usually so circumscribed as to preclude the possibility of its being the immediate, or even remote, cause of death. Again, the mode of death was peculiar; the fatal signs came on suddenly and with frightful intensity, the gasping breathing, the frantic efforts to obtain air (or really to aerate the blood), the imploring look, with consciousness not impaired, seemingly unduly acute, until the final convulsion or gradual cyanosis brought the end. The turgid veins, the occasional venous engorgement, the feeble pulse, and the fluttering heart pointed unmistakably to but one cause, the gradually forming right-sided heart-clot, and the *post-mortem* appearance, as these notes show, gave us a large, tough, chicken-fat clot, obstructing the venous circulation, firmly planted in the right heart and its tributaries. One of the earliest symptoms of this impending danger was undue rapidity of respiration. The child seemed to be doing well, its eruption irregular, probably incomplete, or dark and mottled, and in blotches, when attention would be called to the great

rapidity of respiration, with a peculiar gasping inspiration, fish-like in character. The other fatal symptoms would follow rapidly, and within twelve hours the child, despite carbonate of ammonium, warm baths, digitalis, etc., would die of heart-clot. What caused this?

In a short paper which appeared in the *American Journal of the Medical Sciences* for January, 1882, I gave the experience of a number of cases of diphtheria, scarlet fever, and measles, and then attributed the condition to an increase of fibrine due to the rapid tissue-changes and the malignancy of the type of disease, and urged the importance of pushing an alkaline treatment from the start.

The microscope has shown here that something more is associated with this condition.

The moment that symptoms of malignancy, viz., dark eruptions, illy-defined crescents, delayed and imperfect appearance of the eruption, with feeble circulation, high temperature, and pharyngeal false membrane appear, the examination of the blood showed *micrococci* in abundance in the field. They do not simply lie as impediments to the free passage of blood, though they most undoubtedly do this, and obstruct its passage in capillaries, but they surround the corpuscles, they enter the white corpuscles, and there develop with surprising rapidity, and finally cause some of them to rupture, and their contents will cover the field. Still, if they alone clogged the circulation in the capillaries, caused stasis in the lung, and thereby provoked an accumulation in the already enfeebled right heart, with blood having a tendency to coagulate, the cause of heart-clot alone would seem explained.

We find that they develop with activity when the blood current is retarded, hence we find them spread throughout the heart-clot itself, possibly at times having been here arrested by the obstruction to the flow caused by the lung congestion, known as a frequent complication of these cases, and finally aiding, by a mechanical cause alone, the deposition of fibrine that forms the clot. They do more; they act upon the white blood corpuscles, destroy them in all probability, or, at least, as one of the cases proved conclusively, prevent their change to red corpuscles, and thus the oxygen carriers being either destroyed or reduced in numbers with none to replace them, the tissues retain their detritus for want of carriers to relieve them, and another factor is added to increase mortality.

Granted, then, that the appearance of *micrococci* is coincident with symptoms of malignancy, we must assert that, whether their association be *post hoc* or *propter hoc*, they must have common cause; our treatment receives an impetus in a new direction.

I asked Dr. Formad what, in his experience, most readily checked the development of *micrococci* in his culture solutions obtained from erysipelas, diphtheria, etc.; he answered *alcohol*. Dr. Campbell at once withdrew carbonate of ammonium and digitalis from the treatment for the future, and gave whiskey. Five children had already died with the symptoms I have just described, and the sixth was exhibiting all the malignant symptoms, together with those which experience had taught us came from commencing heart-clot. The child had rapid gasping breathing, was becoming cyanosed, its heart was tumultuous, and the rapid pulse was growing weaker. The instructions were to give *three ounces of whiskey within the next twelve hours*, in frequent and small doses. The treatment was carefully carried out, and the child was saved. In this child *micrococci* were found in abundance in the blood, but none had penetrated the corpuscles, and for a long time the preponderance of white blood corpuscles was noted, which continued until gradually the blood became normal under the use of *arsenic*.

Again, let me illustrate another point. In one ward there were six cases at the height of eruption, I carefully examined, with Drs. Campbell and Markoe, each case. One case was found to be of a malignant type. The child's right cheek was hardened and inflamed, and the mucous membrane showed that glistening surface so manifest in cancrum oris. The breath was fetid; there were cerebral symptoms; and a grayish exudation lined the fauces. We wished to test the microscope; so, without reference to any particular case, we requested Dr. Formad to examine the blood of all. In five the blood showed no *micrococci;* in one a large mass appeared in the field upon the first examination, and this one was the malignant case. This child was placed at once upon large doses of whiskey, and it was also given, in tonic doses, quiniæ et ferri citratis and citric acid.

The *vegetable* acids, especially acetic acid, have also this remarkable effect of checking the development of micrococci in culture solutions; but the mineral acids, also carbolic acid, it is said, have no such action.

The *bichloride of mercury* also possesses this quality to a very marked degree.

Now let me, for a moment, review this subject in the light of treatment, which to us is certainly of greatest importance. We may look at present upon the *micrococcus* as associated with the malignant symptoms of all complications known as "blood-poisoning." It is found in erysipelas, in puerperal septicæmia, in diphtheria, and in malignant measles. Experience has already taught us that alcohol, the vegetable acids, calomel, or corrosive sublimate, are the drugs *per se* in septicæmia.

The action of alcohol and calomel is too well authenticated in puerperal septicæmia to doubt their efficacy.

We know of late how surprising a result will often attend the use of alcohol and *corrosive sublimate* in malignant diphtheria, and also the value of vegetable acids, especially lemon-juice and claret, in this dreaded disease.

My cases simply illustrate one part of the subject. In this recital I do not allude to the other death-producing complications which are so universal. Children with measles will die of cerebral complications, of pneumonia, of enteritis, and entero-colitis—with these we have nothing to do at present. Their treatment will, of course, depend upon the lesions—quinia, opium, hot baths, poultices will all take part.

I have simply brought forward the subject of "blood-poisoning" for your consideration, and as these remarks are based upon the careful study of but one epidemic, they cannot be submitted as conclusive, but simply as illustrative of what may, at some future time, be accomplished by studying, not merely the bacteria anatomically and physiologically, but by experimentation with bactericides as antidotal in their action, in diseases they may cause or complicate.

The conclusions which seem warranted by the statements of this paper, and by observations made in other cases in the Hospital, are as follows:

The *micrococcus* is found in the contents of pustules and vesicles, and also in the blood taken from the measles-papule in ordinarily mild cases, without its being present in the blood taken from the punctured finger. In severe cases, called malignant in this paper, owing to the rapid appearance of morbid symptoms, the blood shows early in the attack numerous patches of micrococcus in the field.

In cases of rapid sthenic disease with high temperature and great tissue change, the evidences of large quantities of fibrine with a tendency to coagulation are manifest. The rapid production of micrococci soon gives the mechanical impediment, and if stasis takes

place from any other obstruction to the circulation, clots rapidly form.

The non-appearance of clots in malignant fevers, attended with fluid blood, such as low forms of typhus, diphtheria, etc., is simply due to the fact that rapid tissue changes have resulted in decomposition, instead of into fibrine-forming substances—no fibrine is formed, hence no clots—but the micrococci are present all the same. These cases are held by some to be the malignant ones, but I think the *foudroyante* character of the others, just mentioned, entitle them to be placed in the same category.

But the micrococcus, if left unheeded, may attack the white corpuscle, as distinctly seen under the microscope, and destroy its contents. The red cells also change in appearance, and finally probably become, to all intents and purposes, useless in the economy. When such a condition is seen by the microscope and found extensive, a fatal prognosis can be given, despite the most active treatment.

In cases where the white blood-cells are as yet unaffected, treatment, when active, will be followed by good results, provided the other complications, as visceral inflammation, etc., are not in themselves excessive.

Alcohol (whiskey in our cases) seems in some way, when given in large amounts, to check the progress of the marauders, to arrest the process of destruction, and, if needful, can be associated with quinia and iron in small repeated doses, digitalis perhaps, and frictions, baths, and poultices, etc. As we have seen, the symptoms presented are contemporary with the changes going on within the blood; they may, *in lieu* of a careful microscopic examination of the blood, be taken as a gauge for treatment; knowing what can and will take place, early active treatment will give the patient some chance for the future.

CORRESPONDENCE.

LETTER FROM BERLIN.

The "Cultures" in the Study of the Acute Infections—The Prevention of Tuberculosis.

HISTORIANS teach us that trivial accidents sometimes determine the fate of empires. No less an influence do they exert at times upon the progress of a science. Mr. Darwin näively tells us himself that he was put upon his train of thought by the perusal of the work of Malthus upon population. What the apple was to Newton, the potato was to Koch. For just as the accidental observation of the fall of an apple suggested to Newton the law of gravitation, the accidental observation of the mould upon the surface of a potato gave to Koch the clue which led to the discovery of the parasite of tuberculosis. But, as has often been observed, the accident must happen to the right person to be productive of the right result. Hundreds of men had read the work of Malthus, thousands had seen an apple fall, or had noticed, perhaps only with feelings of disgust, the decay, the rot, as it is commonly called, upon the surface of a potato, but it occurred to only these three men—posterity will put their names together—to evolve from these simple observations the greatest discoveries of modern times.

The first step in the elucidation of the cause of the acute infections, tuberculosis, and many other diseases due to micro-organisms, rested upon the substitution of a solid for a fluid culture substance; and the first solid substance used was the surface of a divided potato. Koch saw that the surface of a potato exposed to the air soon became covered with mould, which under examination by the microscope proved to be parasites and fungi of many different kinds. It occurred to him that he might secure the isolation of these different forms by grafting them individually upon fresh potatoes, and the result justified his expectations. Hereupon, he proceeded to graft the specific products of disease, and thus by successive experiments to isolate the pathogenic organisms. He soon found that all pathogenic organisms would not grow upon the potato. The parasite of milzbrand, for instance, grows luxuriantly upon the potato, but the parasite of tuberculosis does not grow upon it at all; so that to secure the isolation of these germs he was compelled to devise other solid culture substances, namely, of gelatine and of blood. But the potato was the first, and is still the best sort for certain forms of growth. To quote his own language in a publication long ago: "*Doch das Princip war gefunden und es kam nur darauf an, der Sache eine für alle Fälle passende Gestalt zu geben*" (which might read, very literally translated: Yet the principle was found, and it became merely a matter of securing a form suitable to all cases).

Up to the time of Koch, all experiments with pathogenic micro-organisms were made with culture fluids, and the impossibility of purification of the fluids used, with the implied impossibility of isolating germs of an individual kind, rendered impotent every kind of experimentation. The different, often opposite and contradictory, results arrived at by equally competent observers soon surrounded the whole subject with doubt, even ridicule, and justly brought about that state of scepticism regarding the germ theory so universally prevalent in our times.

The simple substitution of a solid for a fluid culture substance has completely changed the whole aspect of the subject, by giving at once to the study of micro-organisms a degree of scientific accuracy, which is surpassed in no other field of medicine.

I put this fact in the foreground, because, as it seems to me, it stamps the genius of the discoverer more than anything else. Given a field which is clear of weeds and it is possible to grow the grain which has been sowed. And thus it is grown here, again and again, by successive cultivations, the same seeds always producing the same fruit, if I may use so coarse a term, with the same degree of certainty as in the microscopic world. If successive observations show, without exception, the same picture under the microscope, and if successive inoculations show, without exceptions, the same results in the bodies of animals, what other inference is possible than that the micro-organisms are the cause of the disease? In the case of tuberculosis, as in that of milzbrand, septicæmia, etc., there is no question, whatever, of any chemical effects. For the bacilli and micrococci of these diseases are absolutely isolated by successive generations, sometimes to the ninetieth already, in cultured fluids, before their introduction, and they themselves, or their progeny, are universally found after the natural or artificial death of the animal in every product of the disease.

But first let us do justice to the potato. The method of its present use deserves a full description, not only because it was the first solid culture substance, but, as has been said, because for some organisms it is still the best. Moreover, the experiment can be easily made by any one, and the knowledge which the simple observation imparts will do more than words to dissipate the doubts concerning the possibility of the isolation of germs in the mind of the most incredulous.

It will be remembered that the cardinal fact to be proven is to secure the absolute isolation of individual species, and it is claimed that this isolation can be demonstrated even to the naked eye. Hence for demonstrative purposes the potato gives the most conclusive evidence. It will be readily understood that the

potato must be freed of all germs before the experiment begins, must be completely, or as nearly so as may be, sterilized at the start, and the steps by which this sterilization is reached, though tedious, perhaps, in description, will give, if patiently followed out, a good idea of the methods of work on a finer scale, as with the sterilized gelatine and blood-serum preparations.

In the first place, only such potatoes are used as are unfit for culinary purpose. A good, edible, mealy potato would break open under heat, and is hence rejected. A rather watery potato, with a sound skin, is the one selected. One of the attendants understands exactly now what kind of potato to buy. Then the outside is washed perfectly clean with a brush, a small hair-brush, under a stream of water from the hydrant. Every dark spot or surface is now scraped off with a knife, and is followed into the interior until entirely cut away. Should too many such spots occur, or should their exsection involve too much mutilation of the potato, it is cast away. The accepted potato is next scrubbed again with the brush, and is now dropped with its companions, usually to the number of six or eight, in a large glass vessel containing a solution of corrosive sublimate one part to the thousand, to which a few drops of hydrochloric acid have been added to prevent the decomposition of the fluid. Here it remains for one hour, after which it is placed immediately, that is without washing off the sublimate solution which adheres to it, in a steamer, and steamed thoroughly for half an hour. Now the potato is pretty thoroughly sterilized and is ready to officiate as a culture substance for the graft. But every thing that is to touch the potato must be sterilized in turn. First, the knives which are to cut it, one for each potato, and the glass vessels which are to receive it, one for two or three potatoes. Common shoe knives are employed, the blade of each being brought to a glow over a Bunsen's jet. The glass vessels are washed out with the sublimate solution, and covered top and bottom, that is, bowl and cover, with a large piece of moistened blotting-paper, which by reason of its moisture sticks. Now then the hands of the operator are washed with the sublimate solution. Each potato is now halved with the blade of the knife, which has meanwhile cooled down somewhat, care being taken that the hands at no time come in contact with the divided surface. Thereupon a platinum wire attached to a glass rod is also heated to redness, *ausgeglüht* is the expression, and the graft is picked up upon its point, put upon the free surface of the potato and spread over it, with a small recently *ausgeglüht* knife, just as butter is spread upon bread, or as a gardener with his rake spreads the soil over the newly sown seed. The graft is taken from a potato of former experimentation, or from a test tube containing the germ growing in a gelatine or blood culture substance, being selected from the place which shows to the naked eye the thriftiest and purest growth. The original micrococci or bacteria, independently of pathogenic organisms, are obtained by simply exposing a fresh potato to the air, when after a day or two its surface is found covered with moulds or germs of various kinds. Thus after half a dozen experiments, each potato is made to grow a special or distinct mould, without admixture with the others. Of course they soon, in their luxuriant growth, become visible to the naked eye. Moreover, some are white, some are green, some are scarlet; some look dry and mealy; some accumulate in drops, or fluidify the surface of the potato; some are arranged in rings, and so on, each showing its own peculiarity of form and color. If at any time any admixture occurs, both are seen together, and what is called a *Verunreinigung*, an impurification, has evidently taken place. The pure isolated parasite is then grafted anew upon a new potato. At any time, of course, specimens can be removed and studied under the microscope, when individual peculiarities soon come to be distinctly recognized. So potatoes are shown with a line across the free surface growing a scarlet mould upon one side of the line, and a green or white mould upon the other. Or a skilful experimenter may quarter his surface, and grow four different varieties upon it. Thus, too, are grafted upon the potato the yeast fungus, the fungus which colors milk blue in perfect purity and isolation. But the most beautiful and showy of all is the deep-scarlet *micrococcus prodigiosus*. This is the fungus which grows upon the host in damp churches and gives rise to the miracle of the sweating blood. So the merest neophyte may see at a glance whether his graft has been a success or not, and may soon satisfy himself of his ability to isolate an individual species, or to propagate it *ad infinitum*. The potatoes, though kept in the moist chamber formed by the glass vessels, soon become permeated by the parasites and fluidify in the process ordinarily called decomposition. So care must be taken to keep up a fresh supply, and these experiments are repeated every two or three days. To avoid the loss of any species, strips are cut off from time to time, dried, and preserved in bottles, whence they may be extracted at any time for new grafts. The exposure of the free surface of a sterilized potato acquaints the observer with the particular kind of germs which abound in the locality of the experiment. But the analysis of air is now made in a much more satisfactory way, and with other culture substances than the potato. The truth is, the potato is used now more for demonstrative purposes, for as soon as it was found that many pathogenic organisms would not grow well, or at all, upon the potato, search was made for other soil.

The first substitute among the *feste Nährboden* which Dr. Koch was led to employ was a mixture of gelatine with extract of beef. It would take up too much space to go over all the processes employed to secure the sterilization, the clarification, and the coagulation of the nutrient gelatine mixture, and it is especially unnecessary, inasmuch as the details have been published in Dr. Koch's first communication from the Health Office. It may suffice to say that all these objects have been obtained, and that the place bristles with tubes of gelatine and of blood, which, by the most ingenious procedures, are also brought to look like amber, and to have the consistence of gelatine when cold. These culture substances are inoculated by means of the platinum wire, some with septicæmia of various kinds, some with tuberculosis, some with milzbrand, all visible as opacities in the clear fluid, as visible as an opacity upon the cornea, or as summer clouds in a clear sky, all growing luxuriantly, and each ready at any time for examination under the microscope, or for inoculation of animals, which is practised every day. Some of these preparations are over a year old, and are, of course, just as virulent as when first introduced. Three white mice, one large rabbit, and one guinea pig were inoculated to-day, each with a different bacillus or micrococcus, and as fast as they succumb, often before natural death, each is examined for the well-known effects of the disease. Every day two or three animals are brought in and examined for tuberculosis. Some have died spontaneously of the disease when they show just the lesions we see in man; some have died quickly as the result of the injection of large quantities of tuberculous virus, *i. e.*, bacilli, when they show the lungs compressed, and atelectatic from pleuritic effusion, the result of tubercular peritonitis; some, after longer time, as the result of the injection of smaller quantities, showing the typical picture in the lungs of acute miliary tuberculosis. Mice are inoculated at the root of the tail on its dorsal surface, rabbits on the inner surface of the ear, and guinea pigs on the

side of the abdomen. In each case a small incision is made, a little skin pocket is formed by a blunt instrument, and the parasites extracted from the test-tubes with an *ausgeglühter* platinum wire, and introduced into the pocket. In experiments upon rabbits with tuberculosis, a vein of the ear is dissected down upon, incised, and penetrated with the needle of an *ausgeglühter* hypodermic syringe containing the bacilli, diluted with sterilized gelatine or water, sterilized by boiling. Every instrument used, that can be, is first heated to redness, and allowed to cool, and instruments that can not be heated to redness are put into an iron box, with a thermometer sticking out from its top, and then subjected to a sterilizing degree of heat. The culture substances, gelatine and blood, are boiled every day for a number of successive days, as long as any new opacities indicate the existence of germs or spores, before the specific bacillus or micrococcus is introduced. If at any time thereafter a microscopic examination shows the coexistence of other germs than that introduced, the specimen is thrown away as *verunreinigt*, and a new one is prepared. Here there is a laboratory filled with the quintessence of the most malignant of known diseases, any one of which can be imparted to an animal with absolute certainty, with a degree of rapidity, skill, and accuracy which would sound like a legend to the uninitiated.

So far, I have said nothing of the color tests. But this is a chapter by itself for a later date. I may say here now, however, of another part of this immense subject, that Dr. Koch does not at all believe in the practicability of the inoculation of a reduced virus in the prevention of the disease. He thinks that such experiments do more harm than good by spreading the disease, and that all that is necessary is to prevent the dissemination of the sputum which chiefly conveys the disease; for the cases of ingestion of the bacilli in meat and milk, though they do undoubtedly occur, are comparatively very rare. In the cases of bacillar meningitis which he has examined, he has always been able to find caseous bronchial or cervical glands, showing that the ingress of the bacilli was nevertheless through the lungs. Not that tuberculosis in any way implies the pre-existence of caseation. He produces it every day without caseation by injecting it directly into the blood. And even in the cases where the bacilli have been injected into the abdominal cavity, the tuberculosis of the peritoneum which followed was not preceded by any caseation of the peritoneal glands at the point of injection, or of the mesenteric glands remote from it. Caseation, when it occurs, is only an effect of tuberculosis. The only possible cause of the disease is the bacillus tuberculosis, and as this bacillus for the most part disseminates itself in the sputum, it will only be necessary to destroy the sputum to check, if not arrest, the spread of the disease.

But some one might say, Budd said this fifteen years ago. So he did; but what impression did it make? There was no proof. So the detractors of Darwin say both Goethe and Lamarck advocated the theory of descent many years before he lived. So they did; but their views were regarded as visionary until Mr. Darwin showed that the variation of species must be true, because of the struggle of numbers, and the survival of the forms best adapted to surrounding media. So the proof of the poison in the sputum is now at hand, and so soon as the knowledge of it filters down through the profession to the masses of the people, the disease will have had its day.

The promotion came to-day. In the papers it reads that *der Kaiser haben allergnädigst geruht*, etc., to promote *Regierungsrath* Dr. Robert Koch to *Geheimrath*, the grade which is just above it. J. T. W.

BERLIN, June 27, 1882.

REUNION OF DIVIDED NERVES.

To the Editor of THE MEDICAL NEWS.

SIR: In a report of the proceedings of the South Carolina State Medical Association, April 25, 1882, the President, Dr. F. L. Parker, delivered the annual address, and chose for his subject "Primary and Secondary Reunion of Divided Nerves by Suture." Dr. Parker cites cases to show that, though the operation was performed several months after injury and use of electricity, nerve power was restored.

With due respect for Dr. Parker's observations, and not in a spirit of criticism, but rather of inquiry, I would call attention to an article in THE MEDICAL NEWS of February 11, 1882, on "Nervous Degeneration, and Theory of Sir Charles Bell," by Dr. Dalton, in regard to change of structure of a nerve, after it has been divided. In relation to this subject there are two points worthy of investigation.

1. Is Sir Charles Bell's theory the true mode of repair of divided nerve?

2. In suture of divided ends of nerves, do the ends unite, as it were, by first intention, and restore function, or is it probable that, though the nerve may unite by suture, the function is restored only by cicatricial tissue and degeneration and regeneration of nerve below the point of section?

Allow me to narrate a case in point. Harry E., aged thirty-five, blacksmith, while working in shop on October 26, 1880, accidentally received the point of a heated iron rod in the popliteal region, a few inches from insertion of biceps, severing the external popliteal nerve—so inferred from location of wound and results following, as paralysis of muscles supplied by the distribution of this nerve, and loss of both sensation and motion.

In consultation with other physicians, little encouragement was given as to the limb being as useful as before the accident. In walking, the patient had to keep the foot flexed with a strap for several months after injury. In May, 1881, sensation and motion was noticed in the paralyzed muscles, and since then improvement has steadily taken place, the patient being now almost fully recovered.

To give an idea of the degree of paralysis, particularly of sensation, I will state that, in December, 1880, a few months after injury, the patient, while reading, without knowing, held the great toe of the injured limb to a red-hot stove until severely burned, without any manifestation of pain.

Since treating this case, I have read the article by Dr. Dalton on Bell's theory. That is, when a nerve is divided, either motor or sensor, the function was lost, but not permanently, as the ends of the nerve reunite by cicatricial tissue, in which are found new connecting fibres of new formation. The degeneration of the divided nerve is below the point of section, and extends through its whole ramifications; and when the nerve function is restored, it is by a true process of regeneration, that is, the growth of new fibres throughout the separated portion of the nerve.

From the fact that there was no treatment other than that directed to the healing of the wound in the preceding case, its history favors Bell's theory as being the correct one, and I incline to think it is the true mode of repair.

THAD. DONOHUE, M.D.

MEMPHIS, TENN., July 5, 1882.

WHO FIRST OBSERVED DESQUAMATION OF VASCULAR ENDOTHELIUM?

To the Editor of THE MEDICAL NEWS.

DEAR SIR: My attention was lately drawn to a letter in your issue for June 17, 1882, which struck me as a

curious medley of self-contradictions, misstatements of fact, and leaps at conclusions.

In one of a course of ten lectures upon the *Histology of Inflammation*, published in abstract in THE NEWS, May 20, 1882, while speaking of the normal histology of the bloodvessels, I particularly directed attention to one of the physiological functions, which more than five years ago I claimed for the endothelial cells which line the inner surface of the bloodvessels, viz., that of *desquamation* and the *formation of white blood-corpuscles*.

These views and the observations upon which they were based were first *expressed* in a Warren Triennial Prize Essay, January, 1877. They were first publicly advanced June, 1878, in a lecture on *Reparatory Inflammation in Arteries after Ligature, Acupressure, and Torsion*, delivered at Washington. They were first *printed* in April, 1879, in *Smithsonian Miscellaneous Collections, No. 321*. They were again printed in the American translation of Cornil and Ranvier's *Pathological Histology*, January, 1880.

Dr. Wendt, the writer of the letter referred to, says that he announced similar "views as originating from personal observations," in July, 1880, which were again somewhat amplified in Satterthwaite's *Manual of Normal Histology*, 1881. He contradicts this statement, however, in another paragraph, using the words "I never claimed that I actually observed any such process" (*i. e.*, desquamation of vesicular endothelial cells). In the last paragraph of his letter he does not hesitate to admit the rather *theoretical* nature of the reasoning upon which is based his belief in an endothelial desquamation within the bloodvessels.

An examination of his papers, as above cited, shows that Dr. Wendt very dogmatically asserted a normal desquamation of the vascular endothelium, and making a bold leap from that pure assumption, landed upon the conclusion that broken degenerated pieces of a desquamated endothelial cell give rise to the corpuscles of the blood—an assumption which was admitted (*loc. cit.*) to be "insufficiently substantiated by known facts," yet which to his mind appeared to need no basis other than an observed desquamation of the endothelium from the serous surface of a frog's mesentery under the stimulus of inflammatory irritation.

In the letter above mentioned Dr. Wendt states that he has very carefully studied the reports of my observations, during which I saw in the field of the microscope the endothelium actually *desquamate* from the walls of capillary *bloodvessels* in the mesentery of a living frog, and says, with the most surprising complacency, that he deems such pertinent observations "wholly superfluous," preferring to base his assumptions "insufficiently substantiated by facts" upon the supposed analogy between the peritoneal endothelium and that which lines the lumen of the bloodvessels. Such self-complacency appears to be equalled only by the extraordinry *sangfroid* with which he still claims priority for an original observation.

The author of the letter again places himself in conflict with the facts (wilfully, it appears, since he claims to have carefully studied my papers) when he avers in the last paragraph that I never intimated the possibility of the origin of white elements of the blood as due to a physiological desquamation of the lining endothelia of the vessels.

In the already cited lecture, delivered June, 1878, upon page 57, any one interested in learning the truth will find among the conclusions deduced, the following:

"21st. The endothelium which lines the inner surface of the arteries and capillaries may be considered the source of origin of some of the increased number of colorless elements of the blood in local inflammations. From this conclusion naturally issues the corollary that the endothelia in general may be considered as some of the possible physiological progenitors of the colorless elements of the blood. See Fig. 11."

Identical views were advanced more than five years ago in the prize essay already mentioned, and were last published in the translation of Cornil and Ranvier's *Pathology* also already referred to, the latter, seven months before Dr. Wendt's first paper. This last work, as I learn, is used as a text-book in the medical schools of the city in which Dr. Wendt resides.

Whether or not "Dr. Shakespeare's claim to priority lacks the substantiation of facts," I leave to those of your readers who are in search of truth.

Promising not to trouble you again upon this subject,

I am, sir, Yours, very truly,

E. O. SHAKESPEARE.

1336 SPRUCE ST., PHILADELPHIA,
July 23, 1882

NEWS ITEMS.

KANSAS CITY.

(*From our Special Correspondent.*)

PURPURA HÆMORRHAGICA.—At the May meeting of the Jackson County Medical Society, Dr. Charles W. Adams presented a marked case of morbus maculosus, or the spotted disease of Werlhof, with a family history which would seem to establish clearly a hemorrhagic diathesis. The case presented was that of a schoolgirl, aged twelve years, and of American parentage. The inherited predisposition to hemorrhage is seen by tracing the family history. The girl's only brother, a strumous lad, suffers frequently with copious hemorrhages from the superficial and deep mucous membranes of the body, particularly from the nose. The mother, who menstruated freely at the age of eleven, has for years suffered with periodic hemorrhages from the bowel, and with internal hæmorrhoids. The father is one of those full-blooded, plethoric individuals, with a ruddy face, in which the capillary network of vessels are distinctly visible, and in whom slight cuts bleed with more than ordinary freedom. This varicose condition of the smaller vessels is not limited to the father, but is common to the whole family from the grandfather down, affecting to a greater or less extent the face and all the extremities. This tendency is particularly well marked in the mother.

The girl herself has never before suffered from bleeding, nor has she menstruated. The present attack began with mild prodromal symptoms of an undicided character. On April 3, 1882, the patient suffered with pain in the joints, particularly those of the lower extremities—the knees and ankles. The feet and ankles were very much swollen, and the overlying integument was covered with a bright red petechial exanthem. These spots of extravasated blood varied in size from a pin's head to that of a dime-piece. Besides these smaller petechiæ, there were occasional spots of dark brown discoloration (resembling the old-fashioned "liver marks," being of irregular form, and varying in size from one-half to two inches in diameter) upon different portions of the body. Temperature, 99.5° Fahr.

April 4.—No new petechiæ or blood spots; less swelling in feet and ankles; general condition improved; temperature 99° Fahr.; pulse moderately full and regular, 88.

5th.—Morning: Petechial eruption appeared on right hand and forearm; stomach very irritable, vomits frequently, can retain nothing; bowels very loose, passing large quantities of greenish mucus, with blood; temperature 99.6° Fahr.; pulse 94. Evening: Petechiæ appearing on the right arm, shoulder, and extending on down the back, with especially large ecchymoses about

the shoulder-blades; old petechiæ on foot and ankle changing to brownish discolorations, and disappearing; bloody stools; temperature 99.3° Fahr.; pulse 80.

6th.—Patient passed a restlsss night; temperature 100° Fahr.; pulse moderately full, 90; tongue dry and coated; no vomiting, and no pain in joints; old petechiæ fading on hand and arm; new purplish-red spots about the bridge of the nose and the forehead.

7th.—Temperature 99.5° Fahr.; pulse 95; passed a comfortable night and had a free movement of bowels.

In the morning a few petechiæ appeared on the chin, and by noon the whole chin, lower lip, anterior portion of the neck, and a large part of both cheeks were purplish-black, with irregular-shaped ecchymoses. The parts were painful, and also very much swollen, so much so that the countenance was scarcely recognizable. There were weakness and prostration, and for the next thirty-six hours the patient remained in this critical condition, without material change, except a slight rise in temperature.

9th.—Temperature 101° Fahr.; pulse feeble, 110. There were fresh petechiæ on arms and shoulders, and a slight extension of the eruption on the face. The ecchymosed tissues about the lower part of the face were very badly swollen. A large portion of the lower lip, including considerable of its mucous membrane and its integumentary covering, together with a large share of the underlying tissues, sloughed *en masse*, giving marked disfigurement. During the next forty-eight hours there was an amelioration of all the symptoms.

11th.—Considerable improvement in general health, appetite returning, and fever abated. Old petechiæ on hand, arm, and back disappeared.

12th.—An injection was given to relieve the bowel. After this was done, petechiæ reappeared on the hands and arms. Again, on the 15th, after an injection, petechiæ almost immediately reappeared upon the feet and ankles. This tendency of blood-spots to reappear after a passage from the bowel was for some time observed after each free movement. The case made a moderately rapid convalescence, with the exception of the lower lip, which was slow in healing, and upon which skin-grafting was practised.

In regard to the treatment, reliance was placed upon the oil of turpentine, it being given in ten-drop doses, in emulsion, every three hours during the greater part of the illness. The mineral acids and the juice of the lemon and lime were resorted to early in the treatment of the case, but were invariably rejected by the stomach. Quinia and alcoholic stimulants were also given with regularity during the treatment. A wash, composed of tannic acid and brandy (℥j to f℥viij), was used locally and thought to have a good effect in the way of constringing the capillaries and allaying troublesome itching.

Remarks.—This case illustrates very well one of the exceptions to the ordinary rule that purpura hæmorrhagica largely occurs in weak and anæmic subjects, and shows that the naturally strong and plethoric have no immunity from the disease. It also points to the fact that hereditary predisposition often has much to do with its development. And, moreover, it would seem to contradict the assertion of those who hold that purpura hæmorrhagica does not invade the integument of the face.

VIENNA.

(*From our Special Correspondent.*)

HONOR TO PROF. V. ARLT.—Prof. Arlt has recently received the "Comthur" (Commander) Cross of St. Michael's Order of Merit.

LANGENBECK'S SUCCESSOR.—It is announced in Berlin that the Faculty of Medicine have proposed to the Ministerium the name of Prof. Richard Volkmann, of Halle, as successor to Langenbeck. Richard Volkmann was born in Leipsic, 1830, is a son of the formerly famous physiologist and anatomist, Volkmann, who was transferred from Dorpat to Halle, and who died in 1878. Prof. Richard Volkmann received his first surgical training under the eyes of Blasius, the renowned surgeon of Halle, and later became the pupil of Langenbeck. Still later, he was appointed Docent of Surgery in Halle, where, as the first assistant of Blasius, who was suffering at the time from an affection of the eyes which incapacitated him for the performance of most operative procedures, he perfected his many-sided surgical education. Germany is indebted to Volkmann, more than to any other individual, for the introduction into surgical practices of Listerian principles.

MEDICAL NOTES FROM ITALY. *Ovariotomies.*—Dr. Fernando Franzolini performed two operations on June 1st at the Civil Hospital of Udine—one on a girl of 19, with an unilocular cyst, duration 28 minutes, and the other on a woman of 53, having a large cystoma of the left ovary, with extensive peritoneal adhesions; duration an hour and ten minutes. No drainage employed; Lister method; cases promised well at time of report. These were the seventeenth and eighteenth ovariotomies of Dr. Franzolini. [He was the first in Italy to safely remove the entire uterus and ovaries, and has also extirpated a hypertrophied spleen with entire success; his only Porro operation was fatal, as the woman was in extremis from a pulmonary complication.—Ed.]

Total Extirpation of Uterus per Vaginam.—Dr. Calderini operated on May 14th at the Obstetric Institute of Parma, in a case of uterine sarcoma. The woman died of exhaustion in four days. The last operation by Dr. Margary, at the St. Giovanni Hospital of Turin, resulted favorably.

Appointments and Changes.—Dr. Paolo Negri, Second Assistant of the Obstetrical School of Milan, has been appointed, through the *concours*, to the post of Professor and Director of the School of Obstetrics in Novara. Prof. Chiara, chief of the same school in Milan, under a proposition of the Faculty of Florence, with the approval of the Superior Council of Public Instruction, has been appointed ordinary Professor of Obstetrics and Gynecology in the "Instituto di perfezionamento" of Florence. Dr. Luigi Mangiagalli, First Assistant of the same school in Milan, has been elected extraordinary Professor of Obstetrics and Director of Clinical Obstetrics in the Royal University of Sassari. Prof. Edoardo Porro, of Cæsarian fame, has been appointed to succeed Prof. Chiara, as Chief of the Royal Obstetrical School of Milan.—*L'Independente di Torino*, 5 Giugno, 1882.

Drs. Porro, Chiara, Mangiagalli, and Negri, thus honored, have together performed *Cæsarian Ovaro-hysterectomy* nine times, and saved seven women and nine children. Dr. Porro, in his new position, will have greatly increased opportunities for testing the value of his operation. Who are to be his two aids has not yet been announced. Dr. Nicolini was his assistant at Pavia, and saved a woman and child in a private Porro operation. The school in Milan will have an entirely new faculty.

HEALTH IN MICHIGAN.—Reports to the State Board of Health, for the week ending July 15, 1882, indicate that cholera infantum has considerably increased; cholera morbus, consumption of lungs, intermittent fever and dyentery have increased, and that neuralgia, remittent fever and diarrhœa have decreased in area of prevalence.

Including reports by regular observers and by others, small-pox was reported present during the week ending July 15, and since, at 5 places, as follows: at Detroit (4 cases), at Flint (20 cases), at Lansing (one case), July 15; at Grand Rapids (3 new cases), July 16, and in the township of Greenfield, Wayne Co., July 19.

SANITARY EXHIBITION OF THE NEW JERSEY STATE BOARD OF HEALTH.—An exhibition of sanitary, household, and ornamental articles and appliances will be held at Waverly, N. J., commencing Sept. 18 and lasting one week, under the auspices of the New Jersey State Board of Health.

CONGRESS MEMORIALIZED TO CONTINUE THE POWERS OF THE NATIONAL BOARD OF HEALTH.—The State Board of Health of Michigan has forwarded the following memorial to Congress:

Your memorialists, the Michigan State Board of Health, respectfully represent:

That small-pox, diphtheria, and scarlet fever, have been and are being repeatedly introduced into this State by immigrants newly arrived from foreign infected places, and by travellers who have come in contact with such immigrants; that because of the rapidity of travel, and the vast amount of inter-State travel, it is impossible for State or local boards of health, without extraordinary interference with inter-State commerce, to successfully quarantine against or effectually control these diseases while the United States Government permits one or more of them to be introduced so frequently as of late by immigrant vessels which reach this country; that while in ordinary years the introduction of scarlet fever and diphtheria is believed to be of exceeding consequence in causing epidemics, in swelling the death-rates, sickness-rates, pauperism, and general suffering, cholera and yellow fever are sometimes thus introduced, and at the present time small-pox is causing especially wide-spread disaster in this and other Western States; that, by reason of such introduction of diseases, the lives, health, and happiness—those dearest and most important interests of our people—are constantly destroyed or placed in imminent danger from those foreign pestilences from which it is entirely possible for the United States Government to afford protection; that we believe that it is the highest duty of a government to protect the lives of its citizens from dangers which threaten all, and from which no other than governmental protection is adequate; that it is with deepest apprehension that this State Board of Health learns that by reason of insufficient provisions, in the Sundry Civil Service Appropriation Bill, for the National Board of Health, the important work which that Board has lately commenced and is expected to do is likely to be crippled; that this Board believes that now, more than ever before, is a most inopportune time to lessen in any way the activity and usefulness of the National Board of Health, believing as this Board does, that there is no other governmental department, bureau, or "service" so closely connected with the highest interests of all citizens and of humanity.

Therefore this State Board of Health earnestly prays Congress to grant sufficient appropriations to the National Board of Health, and to make such other provisions as will enable it to continue the immigrant-inspection service at all important ports of entry, and on important lines of travel, and to provide in every possible way for the protection of the whole country from cholera and yellow fever, and also from those contagious diseases hereinbefore mentioned which are well known as causing the most deaths and distress, throughout the greater portion of this country.

By direction and on behalf of the Michigan State Board of Health.

NOTES AND QUERIES.

MALIGNANT MALARIAL FEVER.

To the Editor of THE MEDICAL NEWS.

Sir: There exists along the rivers and water-courses in the mountains of Northern Arkansas, a disease characterized by incessant nausea and vomiting, obstinate constipation of bowels, pulse large, slow, and compressible in most cases, in extreme cases quick and wiry. Respiration sighing; temperature, as a rule, low, seldom exceeding 102° Fahr.; much jactitation; tongue broad, indented at the borders, and covered with a moist, white glazed coat; pupils somewhat dilated, and reacting sluggishly to light; skin usually moist, and in mild cases the face is flushed, in the more severe sallow or sodden. The disease occurs in the latter part of summer and early autumn. The laity attribute it to the milk and flesh of cows (milk sickness). Many physicians regard it as a malignant form of malarial fever. I have never seen anything like it in the swamps of the South during four years' experience there. It is useless to say the disease is often fatal. The usual treatment here is alcoholic stimulation, quinia, and laxative enemata.

Any information obtained as to its etiology, nature, or treatment will be thankfully received, for not having access to any extensive library, I have no means of knowing anything of its literature or obtaining any knowledge in regard to it except by observation.

Respectfully,

J. T. CLEGG.

SILOAM SPRINGS, ARK., July 13, 1882.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT, U. S. ARMY, FROM JULY 17 TO JULY 24, 1882.

CORSON, J. K., *Captain and Assistant Surgeon.*—Relieved from duty in Department of Arizona, to proceed to Philadelphia, Pa., and on arrival, report by letter to the Surgeon General.—*S. O. 164, A. G. O., July 17, 1882.*

ELBREY, F. W., *Captain and Assistant Surgeon.*—Granted leave of absence for six months on surgeon's certificate of disability.—*S. O. 168, A. G. O., July 21, 1882.*

HOPKINS, WILLIAM E., *First Lieutenant and Assistant Surgeon* (recently appointed).—To report by letter to the Commanding General, Department of the East, for assignment to temporary duty.—*S. O. 164, c. s., A. G. O.*

BARROWS, CHARLES C., *First Lieutenant and Assistant Surgeon* (recently appointed).—To report in person to the Commanding General, Department of Arizona, for assignment to duty.—*S. O. 164, c. s., A. G. O.*

MUNDAY, BENJAMIN, *First Lieutenant and Assistant Surgeon* (recently appointed).—Assigned to temporary duty at Willet's Point, N. Y.—*S. O., 164, c. s., A. G. O.*

WILSON, GEORGE F., *First Lieutenant and Assistant Surgeon* (recently appointed).—To report in person to the Commanding General, Department of the Columbia, for assignment to duty.—*S. O. 164, c. s., A. G. O.*

OWEN, JR., WILLIAM O., *First Lieutenant and Assistant Surgeon* (recently appointed).—To report in person to the Commanding General, Department of the Columbia, for assignment to duty.—*S. O. 164, c. s., A. G. O.*

EGAN, PETER R., *First Lieutenant and Assistant Surgeon* (recently appointed).—Assigned to temporary duty at the recruiting depot, David's Island, N. Y.—*S. O. 164, c. s., A. G. O.*

WAKEMAN, WILLIAM J., *First Lieutenant and Assistant Surgeon* (recently appointed).—Assigned to temporary duty at Columbus Barracks, Ohio.—*S. O. 164, c. s., A. G. O.*

EVARTS, EDWARD, *First Lieutenant and Assistant Surgeon* (recently appointed).—To report in person to the Commanding General, Department of the Columbia, October 1, 1882, for assignment to duty.—*S. O. 164, c. s., A. G. O.*

CARVALLO, CARLOS, *Captain and Assistant Surgeon.*—Died at Boston, Mass., on July 23, 1882.

THE MEDICAL NEWS *will be pleased to receive early intelligence of local events of general medical interest, or which it is desirable to bring to the notice of the profession.*

Local papers containing reports or news items should be marked.

Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

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